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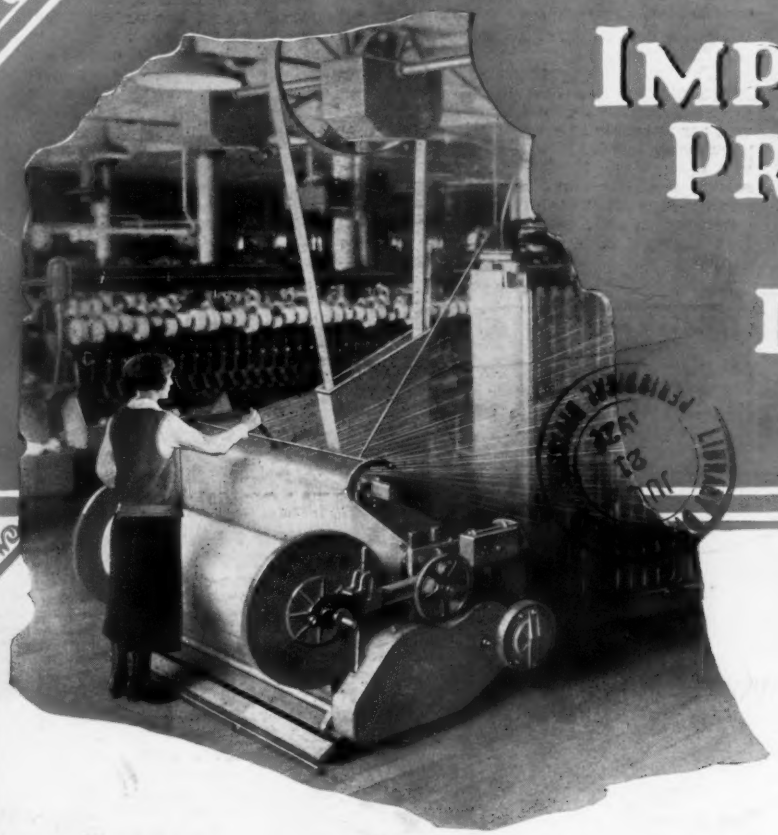

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GENERAL OFFICES AND PLANT

ROCKFORD, ILL., U.S.A.

FRAMINGHAM, MASS. GREENVILLE, S. C.

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Twin Service Speeds Orders

says prominent mill agent

[Based on an Interview with Mr. T. R. SCOTT, of the RUFUS W. SCOTT CO.]

Note: Probably no hosiery mill agent in the country surpasses in size and importance the Rufus W. Scott Co. Its problems, therefore, are the industry's problems. In this interview, Mr. T. R. Scott tells how Kaumagraph's Twin Service has helped his company in its lithographing and trademarking problems.

MERCHANDISE standing idle on shelves . . . waiting. Shipment of orders held up . . . for days. Customers clamoring and complaining about overdue orders.

Such, according to Mr. T. R. Scott, of Rufus W. Scott Co., was a commonplace condition in the hosiery industry, caused by broken promises in the delivery of hosiery packing, rider tickets and other lithographic requirements.

Conditions got so bad, says Mr. Scott, that one of the mills which his company represents was forced to install presses for its own lithographic work. But even this expedient was not a final solution to the problem. For as time went on, and their business grew, their own presses couldn't begin to accommodate all the work.

So that when, about two years ago, the Kaumagraph Company announced its Twin Service—the addition of a lithographic service as a team-mate for its already famous transfer service—the Rufus W. Scott Co. was certainly glad to hear it.

Had Used Kamaugraph Transfers for 23 Years

For ever since 1903, according to Mr. Scott, when the Rufus W. Scott Co. was first induced to try the Kaumagraph Transfer method of marking hosiery, his company had enjoyed a succession of pleasant experiences with the Kaumagraph Company.

"We were among the first," says Mr. Scott, "to see that the Kaumagraph Transfer method of marking was far superior to every method we previously tried. It was simpler. It was faster. And the beauty and permanence of the mark it made were mighty important factors. We found ourselves using Kaumagraph Transfers more and more, and recommending it to our jobbers; until today, practically every one of them uses the Kaumagraph Transfer method of marking exclusively."

The Rufus W. Scott Company uses Kaumagraph's Twin Service for its own samples. "The beauty of the Kaumagraph-applied mark and of Kaumagraph's Lithographic work helps land new business," says Mr. T. R. Scott.

Lithographic Service a Boon

"So that when we heard that Kaumagraph Company had installed a Lithographic Department," Mr. Scott continued, "we knew we would at last get the same kind of service on our lithographic requirements that we had been getting on our trademark transfers.

"Needless to say, our expectations have been more than realized. Now prompt deliveries are a matter of course. The quality of the work is consistently first quality. When we want expert assistance in designing new trademarks, or box tops, or labels, for instance, Kaumagraph's service department is tireless in its efforts . . . they seem *to want to do.* Nothing is too much for them.

"So that our relations with Kaumagraph's Lithographic Department, too, is steadily increasing. We recommend it to our jobbers, for we think this tying up of lithographic service with transfer service is a great benefit. It makes one less complication. It makes one less source of annoyance. It centralizes responsibility. Kaumagraph's Twin Service should be welcomed by the entire industry."

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Charlotte, N. C.
Paris, Ont. Paris, Fr.

Kaumagraph is the only company that offers the Twin Service Mr. Scott so heartily endorses. Send for samples of our lithographic work and of Kaumagraph Transfers, and learn why our Twin Service has earned such commendation.

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COTTON

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"Absolutely remarkable!"

AN OFFICIAL of the Otis Company was speaking. "Those two words are fearfully overworked, but they're the ones that come straight to my mind. The way Celanese brand yarn goes through the machines is absolutely remarkable. Hour after hour, with never a break, never a moment's let-up!

"Think what that means to us. Production kept up to its highest pitch. Costs kept down to the irreducible minimum. The morale of our employees maintained. A quality output assured!"

* * *

The results which the Otis Company has secured through the use of Celanese brand yarn are paralleled in the experience of many other representative mills.

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July, Nineteen-Twenty-Six

The Federal Tax on Corporations.

The next point of attack on Federal taxes of the internal sort will be no doubt the levies made on the incomes of corporations. Beyond the abandonment of the surplus profits taxes of war times, there has been virtually no reduction in the rates of these levies. While other rates have been reduced steadily those applying to corporations have in effect gone up. This is shown by the fact that the total payments by corporations has been increasing.

For every corporation that makes money to have to contemplate turning over 13½ per cent of its entire net income to the Federal Government must be an impediment to business development. That it is, as some claim, only an excise tax and can be treated as an anticipatible cost isn't sufficient justification. It is like many other taxes a dodge, a subterfuge, a matter of following the line of least resistance. From that tax nearly a billion dollars—almost one-third of all its revenues—will be collected by the Federal Government this year.

It seems now that another revision of Federal taxes can be made next year, since under the new tax bill it appears that the Government's collections may yield a large surplus, perhaps as much as $300,000,000.

When revision is again to the fore, Congress should be urged to concentrate attention on the corporation phase of taxation,—one that has been passed by during all the tax discussions of the last five years.

An Important Experiment.

Moves on the part of several big groups of railway employees to procure substantial increases in pay means that the new arrangement for handling such disputes will get an immediate try-out. The railway companies are refusing the demands, which generally appear to be exhorbitant, and the elaborate machinery provided by the new law for adjusting the disputes goes into action.

This law puts the Railway Labor Board out of business and gives to the public no direct hand of control in disputes between railways and their employees. The first move towards an adjustment of one of these disputes will be by a board of mediation appointed for the purpose. It failing, then comes a board of arbitration, to which both railway employees and employers have agreed to submit disputes. It failing, the President may appoint an independent board of inquiry, to procure and publish the facts. All sides agree to take no drastic steps until all the mechanisms of adjustment are exhausted.

The arrangement, however, is in essence one for settlement of all wage disputes by arbitration mutually arranged by the disputants without the public having anything to say positively as to the warrant for whatever is done. This right the public did have in an attentuated and debated form while the wage board was in operation.

The public still is not helpless in the premises. No railroad can pay exhorbitant wages without first getting the money for the purpose from the public. And the Inter-State Commerce Commisison is not obligated to permit the charging of rates claimed to be made necessary by exhorbitant wages.

The crux of the new arrangement is in the virtual pledge given by the organizations of railway employees to not tie up transportation facilities by going on strikes. This was given in return for the Government's seal on the railroad companies' pledge to submit wage claims to arbitration. The employees' pledge to not strike isn't an outright one; there are loopholes through which alleged justification for strikes may issue. But neither the public nor the Government is apt to pay much attention to technicalities in case a big railway strike, or the threat of one, should again confront the country.

The operations incident to the wage controversies that have risen, and of others that are to arise soon, should be watched with care. They comprise one of the most far-reaching experiments of modern times in the handling of wage disputes in which there is a big and vital factor of public interest.

The Wealth of the Nation.

After a long and exhaustive study, the Federal Trade Commission has put forth what is the most exhaustive and probably the most authentic report on the wealth of the country.

This report fixes the worth, in money value, of the United States, as of 1922, at $353,000,000,000. Its makers estimate that at present the total is probably $400,000,000,000. They estimate that the national wealth in 1912 was $205,000,000,000, which would indicate that the country almost doubled in wealth during the last fourteen years. This, however, is not the fact; for there enters into the equation the important factor of the dollar's value. At

the 1926 purchasing power of the dollar, the national wealth in 1912 would have been one-third greater, or around $300,000,000,000.

In truth, when the dollar's value is taken into account, the increase in national wealth is not, by the commission's findings, at all extraordinary. For the eleven years, 1912-1922, the increase, according to the commission's figures was only 16 per cent, in terms of real wealth. During the same period the population grew 15 per cent, which means that the addition to per capita real wealth was negligible. The increase probably was greater than the commission's figures show. These do not seem to take into account the large volume of wealth that was transferred abroad, in extinguishing debts and in making foreign loans or investments.

Moreover, the findings do not take account of imponderable assets, such as increase of and the perfecting of means for producing wealth. These are the most exquisite forms of real wealth. They do not express themselves altogether in actual production; that is, of ponderable products. One of their yields is more leisure; that is, the absorption of less time and labor by production. It is in this respect that the real wealth of the country probably has increased most.

The findings as to the distribution of wealth between different classes of property is interesting. The figures, for 1922, are as follows:

Dwelling houses, furniture and personal effects	88	billions	or	25	per	cent
Agriculture	64	"	"	18	"	"
Mining and manufacturing	49	"	"	14	"	"
Railroads and Public Utilities	46	"	"	13	"	"
Government property	42	"	"	12	"	"
All other wealth	64	"	"	18	"	"

During the fourteen year period covered in detail, it is estimated that additions to the wealth of the country were at the rate of about $5,000,000,000 a year; but, since 1922, it is estimated that the increase has been at a rate of around $10,000,000,000 a year.

Such figures have their value but, by necessity, any that are arrived at are incomplete. Too many imponderable factors are involved for any statistical findings in the premises to be much more than guesses.

Our "Unfavorable" Trade Balance.

One has to go back far into the past to find another time like the present when the foreign trade balance was steadily against the United States for a period of a half a year. For practically every month so far of 1926 we have brought in goods of a greater value than we have shipped to foreign countries. It looks as if the balance for the first half of the year will be against us to the extent of one to two hundred million dollars.

The balance for the fiscal year ending June 30 is in our favor, and so will be the balance for the entire calendar year. This last will be brought about by increased shipments of cotton and grains from the new crop.

The "unfavorable" balance for the first half of the calendar year is in most part a statistical freak. It owes largely to decreased prices of some products we export in large volume, such as cotton, and to higher prices for some we import, notably rubber. It also owes in some measure to increased volume of imports beyond increased volume of exports, indicating our improved buying power.

Our exports of manufactured and semi-manufactured goods—now comprising in value more than half of all the products we sell abroad—have gained since the first of the year.

European recovery, says the U. S. Department of Commerce, is bringing about greater competition against American products in some spheres. Conversely, the recovery is broadening the European market which absorbs about 51 per cent of all of our total export trade.

It may be well, however, for Americans to familiarize themselves with "unfavorable" trade balances; for it is quite probable that we will have them frequently in the future. Huge American investments abroad, the collection of the war debts, as well as our growing need for many imported raw materials all tend to expand the import figures. Our pre-war "favorable" trade balances were in truth unfavorable ones, as they represented excess of payments which we had to make abroad. Much of the "favorable" trade balances since the war have been covered by investments and re-investments abroad. And if annual ones are recorded in future it will be because of further investments. Economic forces, however, will in the end cause any creditor nation to import more than it exports.

There is no reason why our exports should not continue to grow even though we do buy more from than we sell to other countries. What we buy is mostly in exchange for what we sell; hence the more we buy from, the more we can sell to other peoples.

The total volume of our foreign trade continues to grow, which is the important thing.

Of Glorious Memory.

Ennobling in its inspiration, and of intensely strengthening encouragement, thought of our pioneering predecessors is worthy of our time. In a bustling active world it is too easy to become engrossed with matters of present moment and lose sight, temporarily, of the donors of our heritage.

The southern textile industry contains in its comparatively brief history many instances of men whose careers were outstanding, and whose contributions were immeasurable to this industry, which has been aptly termed "a youth in years, a sage in knowledge, and a wizard in accomplishment."

William Greeg, pioneer of southern industry, prophet of the South's great wealth, and founder of the textile industries centering around Graniteville, South Carolina, is one of these figures. His memory was praised and a tribute paid to his achievements recently, when a monument was unveiled at Graniteville, with suitable exercises. The inscription read "William Gregg, born Feb. 2nd, 1800, died Sept. 12th, 1867. The devoted husband, father and friend, and benefactor to the poor. He was by his many deeds endeared to all around him." The monument has an interesting history. It was first erected to William Gregg in the Graniteville cemetery, but was later removed to Charleston, at one time his home, and replaced in Magnolia cemetery. But with the fuller realization of his work as a pioneer, a leader and prophet, it has been returned to Graniteville, to crown the hills and overlook the great work of his mind and heart.

Angel Stuff

BY U. DODGE.

Once there was an Itanan named Mike.

That doesn't sound just right, because according to all the best traditions, anybody named Mike should be Irish, but then this is not an ordinary story. It seems that one day when Mike and a friend whose name, we are quite sure, was not Pat, were walking along the street in some Wop town which could have been Rome or Athens or Atlanta for all we know, Mike stubbed his toe.

The friend did the usual thing and laughed, whereupon Mike did the usual thing by landing two swift kicks, first on the obstruction he had fallen over and then on his friend, taking care, however, not to hurt either his friend or himself. Then he took time to sit down and estimate what toes were left him and how much skin had left him, and finally, to see what he had fallen over.

It was a block of marble.

It wasn't a very good marble as blocks of marble go, being rather full of flaws and defects of first one kind and another, and had evidently been condemned and discarded by somebody who had thrown it out in exactly the right place for Mike to fall over in an unguarded moment. So you couldn't really expect much of it. But the more Mike looked at it, the better he liked it, and finally he decided he wanted it, and said so. Then the friend, whose name was not Pat and who was in a hurry, wanted to know what for and how come and besought him for the love of Mike to put whatever loose toes he could find in his pocket and put on his shoes and come on, but Mike remained obdurate and wouldn't leave, and when his friend pressed him for a reason he said he wanted that block of marble because there was an angel in it.

Think of that! And after all the things Mike had called it, too, while he was doing a handspring over it. No doubt the angel was shocked, and maybe that was what Mike was thinking about when he decided to do the angel a good turn and get her out, but anyway he went to the Board of Health or the Rotary Club or whatever was the proper place, and secured permission to haul the block of marble home and set it up in the back yard. Whereupon the friend, whose name was not Pat, gave up waiting for him to come along and went down town by himself and gave out to all who would listen that poor Mike had suffered concussion of the intellect and gone completely off his nut.

Mike didn't care. He borrowed the ice pick from next door and a tough mallet from the chairman of the local Democratic Club, and started chipping on that block of stone. He had company, too. All his friends gathered around to look and laugh and make jokes about Mike and the angel and to explain to each other how he knew there was one in there. They didn't laugh long.

Every time Mike chipped off a piece, that block of second rate, flawed marble looked a little better. After a while it began to sort of take shape, and before long there began to appear an arm, a foot, and then last of all, a face. The laughter stopped. The jokes were hushed. The mocking friends began to see the angel, began to realize that underneath all the flaws and bad places they could see on the outside of that stone, there was a marble of purest quality. They began to realize that their nutty friend had been able to see in it something which they themselves had passed over time and time again, so they left him to do his work and stood watching in respectful silence until, in the end, they stood before a thing of enduring beauty.

This incident is told of Michelangelo Buonarroti who lived from 1475 to 1564, so you see it is an old story. We do not know if it is quite true, but we do know that his first work of any consequence was a kneeling angel which you can see for yourself any Sunday afternoon that you care to run the flivver that far, at Bologna, which is a town in Italy, and not a hot dog. Furthermore, as Mr. Michelangelo was from all accounts a rather sourminded gentleman who took himself and his work very seriously, and it is possible that some time in the future we might meet up with him in a place full of angels or not, according to the locality, we wish to make haste and say that we have treated his story thus frivolously with the very serious intention of drawing therefrom a real good moral , most of which you can think out for yourself.

If you happen to be pretty well down toward the bottom of the ladder of success, especially if you have just lately started out to swing the cotton mill business around your head by its whiskers, you might be more or less willing to admit that you need some considerable carving before you even remotely resemble the Angel of Ability which you hope some day to be. If, however, you are one of those who have already been whittled out to the place where the office boy jumps when you cough and various salesmen appear to be extremely anxious as to the state of your health, you might think that you are a really admirable piece of sculpture. Maybe you are.

All of us, though, while we are not altogether creatures of circumstance, do take a deal of sculping before we resemble anything much either human or divine. Some of it we are glad to get and appreciate. The boy who is attending night school; the weaver or frame hand who is learning at odd moments how to fix; the overseer trying to grasp some of the broader aspects of this great business, are doing some of their own chipping. Other work must be done by other hands, and the process is not always enjoyable. The boss may be an old sorehead like you think he is, but when he bawls you out for any reason, he might not merely have gotten out of the wrong side of the bed. He might be, and more than likely is, trying to make something out of you. And it might be well to remember that more than likely he doesn't think you are quite as good a piece of material as *you* think you are. He sees a few flaws *you* don't know are there. Probably he has despaired long ago of ever getting them knocked off, but he is still trying.

On the other hand he might not be a good sculptor. When he gets through with you, you might not be an angel at all, but something with horns and a forked tail. That is for you to decide. If you think that way you had better hunt up another artist to do your moulding. For moulded you must be, don't forget that.

If you are the boss, it is natural for *you* to think that *you* are the perfect specimen to which others must aspire to shape themselves. You are doubtless sure that it is for

you to do all the chipping. Maybe so, but more than likely not. While folks are standing around in awe and admiration of the completed work, they possibly see a few chunks that could be whacked off for your improvement. When they get away they whisper confidentially "Oh boy, if I'd only had a hammer and a good cold chisel!" The poor boob who apparently misunderstands orders or who fails to carry them out as promptly and as completely as you would wish is not always as stupid as you tell him he is. Sometimes he is merely trying to keep you from making too big a fool of yourself, and risking his job to do it.

It seems that we must all help thump each other into shape. Sort of "Diamond cut diamond" stuff. Think it over!

Handling Colored Cotton

BY WILLIAM B. NANSON.

The carding and spinning of colored stock is fast forcing its way into nearly, if not quite, all the mills where colored goods are made, and as it is on the increase, is it not well for our manufacturers to stop and consider over the subject, "Does it pay to color before it is spun?" or in other words, which is the best and cheapest to color in the raw stock and then card and spin, or to card and spin and then color in the yarn?

There are three ways of preparing cotton for coloring. Some carders have the raw stock dyed from the bale before it is picked or carded. This way does not always appeal to the writer. It depends altogether on the quality of the stock, sometimes it contains so much dirt and short fly, etc., that it is cheaper to open and clean it before dyeing for it must be borne in mind that the raw cotton loses about 6 or 7 per cent in cleaning which is a dead loss and hardly pays for dyeing because this 6 or 7 per cent has to be dyed along with the other cotton. Some carders put their stock through an opener before dyeing it and again others open, pick and card it before coloring and each one thinks he is doing it in the best possible way.

Cotton, before it will take the color, usually has to be boiled and these boiling processes take out quite a lot of the natural oil and wax and would of itself make it much harder to card and spin; and when the color is added, that only makes it more difficult to manufacture. If the stock is colored raw or direct from the bale it does not require any more machinery than white stock. If it is put through an opener first it requires that many more openers as is necessary to handle the stock. If it is picked and carded once before coloring it requires that many more openers and pickers as would be needed if increasing the product that much, but it does not require more cards because we card it on the breaker cards first. These laps are sent to the dyehouse and the stock is colored and returned to the picker room and made into laps suitable for the finisher cards. It then passes along the same as other stock, but not with as little trouble as white work.

I think I have made it plain why all do not pick or card once before coloring, it is a matter of dollars for extra pickers. And why do not all color in the raw stock, instead of picking and carding once before coloring. It is that we cannot get as smooth and nice a yarn where it is colored in raw stock as we can by carding it once, because it is more difficult to card out the foreign substances after coloring than it is before. Again it does not cost as much for coloring material, for the reason that there is not the foreign substances to color, therefore the quality of the yarn would pay for the outlay of a few thousand dollars for more cleaning machines if much colored work was done. The trouble of running colored work is usually static electricity. This is a subtle agent but is easily controlled if we only know where it is.

Another trouble in running colored work is to get good help and retain it, for help do not like to work where the hands, face and clothing are colored as much as the stock itself, therefore, though the help may be inferior, and it usually is, more compensation for their work is usually asked and obtained.

There is still another difficulty in running any light or delicate shade, and this may occur on *all* shades and that is the different shades of colorings of one day's work with another, for dyers will get careless at times. This of course is the dyers' business, but even so, much rests upon the carder for he should know enough to be the first to detect the "off" shade and by holding back a day or two's work in the picker until the shade is right, or by other means he can so mix these different shades that it is not so far off the right shade, or at any rate it may be of only one shade instead of several.

Another thing, there is great danger of fire, especially if colored stock is used at once after drying. Any colored or bleached stock should lie in the storehouse, after drying, at least about two weeks or long enough so it will regain or reabsorb the natural moisture of the air, which is about 8 per cent, before it is used. Moreover all colors must be washed well and softened if necessary before they are used. All this is very necessary to the smooth running of the work in the carding and spinning departments. But when no colored stock is kept ahead and it comes hot and dry from the dry rooms to be spun the same day there is trouble ahead for both the carder and spinner and all through the mill.

The different methods of dyeing and finishing colored stock have much to do with its ultimate running into yarn and the way it is handled in the dyehouse has more to do with the successful running of it subsequently, but it must be borne in mind that the *stock* used is an important factor and this is what would guide the writer in his method of dyeing.

If the stock average strict low middling or under, I should insist upon having it carded once before coloring and all the processes which go before that. If the stock averaged low middling I should only want it put through an opener. If, however, good middling cotton is used, dye directly from the bale and good results will accrue.

If low grade cotton is used, the sand, dirt, leaf and broken fiber must be removed before being spun into yarn and it can be done easier and better before dyeing than after, therefore I would always say clean and card once before dyeing. And there is another point in favor of carding low grade stock before dyeing in the money saved

in dyestuffs; the sand, dirt, and leaf and broken fiber absorb as much coloring matter as pure cotton, and it is safe to say that stock averaging low middling will lose about 10 per cent before it is spun into yarn, or even before it is made into roving, and besides losing 10 per cent of the stock we have lost 10 per cent of the coloring matter, which is no small item.

If good middling cotton (or better) is used, and dyed from the bale, and care is exercised on the pickers so as not to lose much fiber, and the revolving flat card is used to card it with, and a moderate amount carded per card, there is no reason why good results should not occur. As far as I am concerned I am in favor of both of these methods of dyeing cotton and it is only the stock itself which would determine which to use. I would, under no circumstances desire to double card colored cotton after it was colored as it is more difficult to card out the dirt, leaf and broken fiber then it would be before coloring.

Mistakes are made in buying low grade or stained cotton for colored work. Many think it is just as good because it is to be colored again, but whatever may be saved, generally speaking, in the cost of the stock is more than lost in decreased production and poorer quality, to say nothing about the extra waste that a poor quality of cotton will make. For example there are two carding and spinning rooms, equal in machinery and spindles, one using stock averaging low middling and the other good middling and each making four hank roving and 28s yarn. There is no question which will give the greater production on colored work; the extra production given, both per pound and generally from the good stock will offset the cost or difference of cost in stock to say nothing about the dust, sand and broken fiber which is all charged, but unaccounted for.

Dyeing the Cotton.

The way stock is handled in the dyehouse and made ready for the mill is quite an important point in the successful running of colored work. Almost any bright man can follow the present day formulae given by the makers and produce the desired shades, but much more than this is to be done to have it run successfully in the mill. All the different colors should be left, when finished, as near their natural condition as is possible and a very near approach to this can be had by taking time to wash, soften and extract them. Then they must be dried cool if possible and after drying they must lie in the bins or bags at least two weeks (better three) or until they are cold and have reabsorbed 8 or 10 per cent of moisture.

Many colors, when treated to a liberal washing of soap water and clear water, give little or no trouble about carding and spinning. The idea is to make the color fast, or as fast as can be expected and have the stock run well.

Colored work should be softened with palm oil or monopole oil soap and washed freely (generally) and it should not be finished in hard water, and even then, when all has been done that can be done for colored work, it will not run as well as white work.

For dyeing loose cotton, direct dyestuffs are preferably used because they preserve the natural softness of the fiber and do not cause so much felting as other dyestuffs, and, on account of the absence of metallic mordants, do not attack the card clothing and may be dyed with 2½ per cent of soap and 10 per cent of sodium phosphate, or what is better 2½ per cent of soap and 10 per cent of ammonium phosphate crystals. Sodium phosphate or rather its soda base is rather too strong for some colors for giving us the best results, therefore, for most colors ammonium-phosphate crystals are recommended, especially for fixing mordants. If half silk is dyed with soap and sodium phosphate, the silk is left almost colorless, but if 20 per cent of kitchen salt (or Glaubers salt, which is better) is added to the bath both fibers are dyed alike.

The machines that are used for dyeing loose cotton are of two kinds, the first is on the order of the paddle wheel type and requires a large quantity of dye-liquor in which the cotton is suspended and is moved about, and, secondly, machines in which the cotton is tightly packed and in which the dye-liquor is forced or sucked through by means of pumps, etc. In the first the cotton goes through the dye liquor or is revolved through it. In the second, the dye liquor is forced through the cotton, the cotton being stationary and tightly packed. I like the second method best but it is unsatisfactory and does not dye level shades. In my experience the first method renders the goods level but "stringy" and "matted," and the second method renders

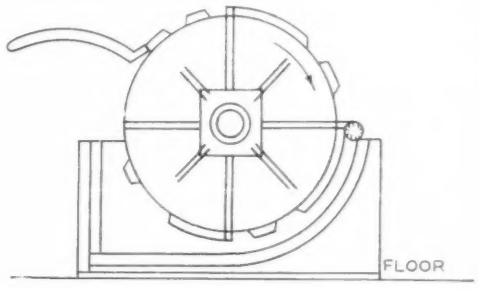


Fig. 1.

the goods full of "channels" and therefore unlevel in color unless the greatest care is used in packing, and even then results are uncertain.

The first type consists of a wooden trough containing the dye-liquor. This is provided with a top cover which prevents the steam from escaping during dyeing, with openings on each side through which the machine may be charged and discharged. The tank is usually placed from 12 to 24 inches below the floor level. The loose cotton is placed in the hollow metal center which is divided into four compartments by the partitions. In this way four batches of the same color are dyed at the same time. Every compartment contains a projecting piece which assists in keeping the cotton in a loose state during the dyeing operation. So that we may obtain a perfect penetration and circulation of the dye liquor through the cotton, the copper or nickel sheets, which form the lining all around, are perforated. The doors, which are fastened tight during the operation of dyeing, allow the filling with cotton of each compartment and the emptying of the same. When all the compartments are full, the doors are shut and the cylinder is rotated slowly as shown by the arrow; this carries the cotton to be dyed slowly through the dyebath. The cylinder is driven by means of gears and the compartments turn the cotton over at every revolution. This type of machine will dye from 1000 to 1500 pounds of cotton. It takes about two h.p. to drive the machine and the dye vessel holds about 1300 gallons of liquor. See Fig. 1.

There are other machines of this type that may be investigated but our space is too limited to discuss them here,

and the principle is the same.

In the second type of machine the cotton is tightly packed and the felting or matting of the fibers does not take place. If the results are to be satisfactory the packing must be carried out with care. The dye liquor must be entirely free from undissolved particles as the cotton acts as a filter and retains all particles and becomes unevenly dyed.

The apparatus must consist of a wood or iron cistern which contains the dye-liquor, below which is placed the centrifugal pump which circulates the liquor through the tank.

For dyeing the sulphur dyestuffs this whole apparatus must be made of a material that will resist the action of the dyestuff. If it is desired to store the dye liquor, a three or four way pump may be used which will either pump the liquor through the cotton or into a tank over head or the cotton can be washed and run out, etc. This closed and packed apparatus may be used or should be used on all vat colors; though it is subject to channeling and is not so good for general purposes as the former.

I will say here that nearly all of the vat colors and many of the mordant colors and sulphide colors are and may be dyed in the usual way, but they are expensive, i.e., all but the sulphur colors.

The substantive colors may be dyed on either of the previous methods and the previous wetting out in the machine is at the option of the dyer, the writer always boiled out first for light colors. If the goods are to be dyed in the open machine open out the cotton well and then fill and start the machine, then heat the dye bath to the boil and work for ¾ to 1 hour near the boiling point. Use a "short" bath, and deeper and more level shades are secured if the cotton is allowed to revolve and "feed" for some time, say ½ hour, in the cooling bath. Let the cotton cool before rinsing and after lifting it out of the machine.

In some cases, in fact nearly all, the cotton does not want washing after dyeing but is hydroextracted at once, that is to say after it has cooled.

When dyeing shades, use in the dye liquor a percentage of 2 to 3 pounds of soda ash and 20 to 30 pounds of Glauber's salt also an addition of one pound of monopole soap or turkey red oil per 100 gallons of dye liquor. This insures penetration and level dyeings.

It is quite necessary when dyeing in a machine to get dyestuffs that are completely and easily soluble and also which do not exhaust too easily. The stock must be tightly and evenly packed in the machine, and the quantities of Glauber's salt that are added must not be too high. It is much better, in many cases, to dye for some time with the soda and dyestuff alone, this as a "wetter out" and leveler, and then add the Glauber's salt (dissolved) at a later stage.

It is always difficult to dye with hard water and this must *not* be used, even if soda is added. Turkey red oil, monopole soap, etc., may be always added to the dye bath in order to leave the cotton soft and also to assist in wetting it out. The goods may be rinsed *if necessary* in the machine and it is usual to dye at the boil for ¾ to one hour. In very light or bright shades the cotton must be bleached first; in heavy shades this is unnecessary. It is usual to add the dyestuff directly to the dye bath, this is *not* good, it should be dissolved separately in another vessel and sieved in the dyebath, but if it is put directly into the dyebath the soda should be put in first and boiled, then the dyestuff, thoroughly dissolved, and finally the Glauber's salt.

Nearly all of the substantive colors can be dyed from an alkaline bath but this is hardly recommended as the Glauber's salt, common salt, etc., used acts as an accelerator and fastener and moreover it makes the goods heavier, but the addition of soda, soap, turkey-red oil, or sodium phosphate acts as a retarder and therefore tends to get more level dyeings.

Light shades may be dyed at a lower temperature, say 120 to 140 degrees F. The fastest colors are, however, secured when dyeing is carried out at a boil.

Many of the substantive colors can be diazotised and it is of importance that they should be thoroughly cooled off before diazotising. The diazotising, souring, and developing may also be carried out in an ordinary tub or the cotton may be handled in nets and passed from one liquor to another or, if the loose cotton is dyed in special machines, all these processes, i.e., the developing, are carried out in the same machine; in this case it takes less sodium nitrate, about 1 to 1½ per cent, and hydrochloric acid, about 3 to 5 per cent; it also is advisable that the sodium nitrate solution and a small portion of the acid be circulated through the liquor for some minutes and then add the rest of the hydrochloric acid gradually.

Mineral and basic colors, though they may be dyed on the machine as loose cotton, are too hard usually for spinning. The natural colors such as indigo, logwood, etc., are out of date so far as machine dyeing is concerned although they can be dyed at one run or on the same machine.

A considerable number of the sulphur dyestuffs are now found the best to use for spinning, and their fastness is good enough for most purposes. These sulphur blacks are direct dyeing colors and some of them may be used as vat dyestuffs. Also it is possible to dye some of the substantive dyestuffs in the same bath as the sulphur dyestuffs (to fix up or brighten the shade) although they must be prepared, i.e., the dyestuffs, separately.

The general rules for dyeing with the sulphide colors are as follows:—in nearly all instances the dyestuffs must be dissolved with soda ash and sodium sulphide, then they are dyed with the addition of Glauber's salt or kitchen salt; Glauber's salt is the best, especially for spinning.

The after treatment of sulphur dyes varies considerably and therefore it is necessary to consult the manufacturer's shade card about all these points which we have not room for here; suffice it to say that the sulphide dyes must always be used in iron, wood, or monel metal as copper injures both the dye and the copper, and the goods must be washed well and, if for spinning, the blacks especially must be *finished* in the machine in oil or soap.

So far as loose cotton is concerned the stock, dry, is thrown into the boiling bath to which the solution of the sulphide and soda with the dyestuff solution is mixed, then Glauber's salt is added. *After* the cotton has been thoroughly penetrated by the dye liquor it is then run boiling for about one half hour and then allowed to *"simmer"* for another half hour.

The cotton may now be removed (after washing) from the dye-machine but it is better if allowed to remain in the cooling liquor several hours or overnight or pull it out and let it lay in the dyestuff over night, then wash and finish. It is necessary to provide a tank for holding the dye liquor into which it is pumped for storage after each dyeing be-

cause the washing and after treatment, if required, can be then carried out in the dyeing machine itself.

In dyeing loose cotton in the machine it sometimes happens that one part of turkey-red oil to 1000 parts of the dye bath are used and the cotton may be finally treated at 140 to 160 degrees F., in a bath containing either oil or soap or turkey-red oil and sometimes a little starch is also used but never by the writer.

Smothering after dyeing, and steaming with some colors, especially blues, is much used on some sulphide colors and is an improvement—remember that the stock is for spinning and must be strong and soft and must have as little handling in the dyehouse as possible, therefore consult the dyestuff manufacturer before venturing on dyeing as all colors have different modes of procedure and this article only points out the way.

Loose cotton may be entered into the vat in the vat dyeing process, which is fast to light and other influences, without previous wetting out. Work it about 25 minutes, then press it out and allow it to oxidize. The stock is finally soured, if necessary, rinsed, hydroextracted and dried, in all cases cotton for spinning should be dried as cool as possible, say 150 degrees F. The stock dyed as above is fast and good for handkerchief borders or ginghams, etc. A vat should be made up of 500 gallons soft water, cold, and ½ a gallon of hydrosulphite. The following is then added from the stock tub, 25 pounds Indigo M.F.B. Vat 2, 20 per cent; ¼ gallon caustic soda lye 76 T., 10 pounds soda ash, 1½ gallons hydrosulphite. Should the liquor show a greater specific gravity then from 7 to 9 Tw. a smaller quantity of soda ash may be used. Other makes and colors are used in a little different way and we only mention one as an illustration; therefore, it is best to see others, especially your dealer's. Vat dyes are easy to handle and they dye goods of extraordinary fastness, if they are right, but they are expensive and should be only used where fastness is a desideratum.

The mordant dyestuffs are fast enough but as they all call for metallic mordants and numerous dyeings they are not suitable for loose cotton.

Loose cotton may be dyed by the oxidation process such as aniline black, but it rubs badly if not softened by oil or soap after dyeing. It is often dyed on a bottom of sulphide or a substantive black. Of course it can be dyed in the usual way but this, while giving a good clean black, involves too many changes to be of interest here.

I would state that all raw cotton below the grade of good middling be thoroughly opened and cleaned before dyeing, that most cotton be dyed dry, that no cotton must be finished sticky with softeners, and that it should be dried as cool as possible, say about 120 degrees F.

In opening after dyeing the stock should be run but once through a Buckley opener, evener, and breaker combined, it should then be run, if for warps and fine goods, through revolving flat cards making four ends at once through the slubber, fine frame and ring frame. If for filling, through a Buckley opener, evener into boxes, then through a breaker card, roller card and condensing card, the condensing rolls then put on a mule and spun into filling. This is only a rough outline of the spinning of the yarns. It is better to dye the white yarns on the beam by a suitable machine and use the colored yarns for filling only.

It must always be remembered that yarns spun from dyed stock vary considerably in color according to their twist and drafting and it is better to keep track, in some way, of how each lot is done, so as to insure a uniform product at all times, sometimes months may elapse between two different lots, and it is necessary to know how each is done.

COTTON CHATTER

By Chatterer

It seems to be
The fault of many
Who have the charge
Of their villages
To let things go
Until it takes
A lot of money
To get things back
As they should.
A little work
Constantly done
Will do much
Toward the aim
Of keeping fit
Every house
All the time,
And the expense
That it takes
Will not be felt
If you do
Just a little
All the time.

From a powder plant in 1921 to the seventh city in population in State of Tennessee in 1926 is the record of the development of Old Hickory, Tennessee, by the Nashville Industrial Corporation, the purchasers from the Government of this war expenditure.

The immense rayon plants of the Du Pont Rayon Company are rapidly getting into full operating swing and the demand for houses has resulted in additions to the city already being made. Middle Tennessee with its surplus of labor, low taxation, and good transportation is rapidly coming to the front as a manufacturing center of the New Industrial South. Only 17 per cent of the population of Davidson County, of which Nashville is the county seat, is employed in industry.

Industries desiring a southern location will find at Old Hickory many advantages, especially with Nashville at its door, it has all the advantages of this educational center and still be a manufacturing community. Old Hickory is ten miles from Nashville with auto busses and street cars to the city.

National Erie Blue Green CW is a new direct dye brought out by the National Aniline & Chemical Co., Inc., 40 Rector St., New York City. The company particularly recommends it where a straight color is wanted for dull shades of green and for general shading purposes, stating that it is suitable for union goods, dyeing cotton, wool and silk practically the same shade, tinting acetyl cellulose slightly. Samples and technical information, it is stated, may be procured at any of the company's branch offices.

Warp Sizing

BY PAUL SEYDEL.

Analysis.

If genius is a capacity for taking infinite pains, no one has this quality more developed than a real analytical chemist. Of course a real one is as scarce as a real genius.

When a chemist solves the problem of identifying the different ingredients of a complex mixture of organic compounds, he has performed a task worthy of much greater praise and reward than he generally gets.

I once was asked to exactly duplicate a sizing mixture. I would have hesitated to do so if it was not that for excellent reasons I knew the exact composition of it, being the inventor of its formula. I first checked it up and my checking showed it had not changed since the day I was familiar with its manufacture. I then duplicated the formula and methods of mixing, reactions, temperature control, all details of which I had carefully kept notes so that the sample and my duplicate looked very much alike. In order to convince the client that the duplicate was perfect, I took a quantity of both to an experienced analyst, in whom I had great confidence, and told him I wanted a report showing the differences if any. The analyst asked me many questions, which a man with less knowledge and reputation would have had too much false pride to ask. To simplify his work, I told him exactly what to look for and to simply determine proportions. After a week he called me up and told me that in spite of diligent efforts he could not identify all the ingredients I had told him to look for. I conferred with him, checked up on his results, made a few suggestions and he went back to work. At the end of another week he offered me his report, which read substantially as follows:

"The two samples submitted have been analyzed and without guaranteeing the accuracy of findings the proportions of the following ingredients have been found . . . . I am inclined to believe that the composition of the two samples is identical."

Next time I saw him I told him to send me a bill. He said, "Seydel, the time I spent on this is more than I care to charge you for. I enjoyed the work and you taught me a thing or two but do not give me another job like it unless you are prepared to pay one or two hundred dollars for it."

And this was in spite of the fact that I told him what to look for and how to do it and just to determine the proportions. What would he have said had he been compelled to grope in the dark? If the average analyst before turning in the result of his analysis tried to make a sample of the goods according to his findings, he would find out how far off he is in nine cases out of ten, especially if he tried to obtain identical results with it, by actually using his material in a practical test.

I might be able to explain why some so called chemists find materials that are not present and do not find the ingredients that are actually there but this would involve me in too scientific a discussion for the object of this paper.

The purpose of my remarks is simply to state that we must distrust any analyst who claims that he can identify accurately the component parts of a complex mixture of organic compounds at all, and even one who claims to be able to make an approximate guess without going to so much trouble that the charges for his work would be prohibitive. We may readily determine the elements but quite often will fail when reporting the combination of these elements. To make this clear, let us cite an example. An analyst may report a compound to contain glycerin. The glycerin may have been in combination as it is in tallow or it may have been free and this makes all the difference in the world, as to its properties and value as a sizing ingredient. In this particular case, the glyceride called tallow is merely a softener or lubricant, insoluble in water, whereas glycerin is a deliquescent highly soluble in water and is no lubricant.

The chemist divides materials in three groups, (1) elements, (2) compounds, (3) mixtures. Elements are readily identified. The second class is very numerous, but its units are perfectly definite in composition. The third is of course extremely numerous. There is no fixity in its members which often makes it extremely difficult if not impossible to identify their nature. Sizings are often very complex mixtures and from their nature very hard if not impossible to accurately analyze, even approximately. It is next to impossible to accurately determine the proportions of a mixture of fats and of gums if it is composed of fats that are very similar chemically. There are dozens of gums all derived from starch which are equally as hard to identify. Once cooked or chemically treated it is next to impossible to differentiate between potato starch, tapioca starch, corn starch and the gums produced with them, especially if they are mixtures of different starches and gums.

The analysis of a sizing compound is valuable to check up whether successive shipments are similar as to proportions of such ingredients as total fats, total moisture, etc., but are a very poor indication of the money value or the efficiency of the compound.

The actual value of a sizing compound can only be determined by practical demonstration in the mill and the sizing manufacturer being mainly a consulting chemist to whom problems are brought, it is up to him to solve them to the best advantage of his client. He furnishes the material only as a part of his service. The most important service is that of a very thoroughly specialized education and an intelligent application of this specialized knowledge. The mill, for this reason, finds it to its advantage to deal only with concerns who are known to be thoroughly reliable and have scientific equipment and personnel fitted for this very special work.

Chemistry is a highly specialized science and has more subdivisions than any other science. The fact that a man is a graduate chemist does not qualify him any more to pass judgment on a warp sizing problem than the average dentist is qualified to operate on a patient for appendicitis or any other major operation outside of his specialty.

There are some tests that can be made in cotton mills without the services of very competent chemists. The moisture test should be made especially of the warp as it comes off the slasher. For this purpose right after the loom

beam is filled, before starting the next beam, ten or twelve inches of warp are cut all the way across. This is put immediately in an empty, air tight, jar, which has been allowed to remain open in the room before it is used long enough so as to have its normal temperature and moisture. A glass fruit jar is an excellent receptacle. This is sealed immediately after the sample is put in and sent to the testing room. Electric ovens, very simple of operation, can be used for the purpose of determining the moisture. The sample after being weighed on a precision scale is dried at 220 degrees Fahrenheit until three successive weighings at 15 minutes interval show no more decrease in weight.

The ideal moisture content of a warp for good sizing is between eight and nine per cent and this should be as it comes off the slasher, not a regained moisture, because if the size has been dried so as to contain much less than eight per cent it will have lost elasticity which regained moisture cannot return to it, the elasticity that overbaking has caused it to lose is lost permanently.

It is far better to dry a warp with one pound pressure on the slasher drum than with five and infinitely better than as is sometimes done with ten pounds or more. Of course the amount of pressure needed depends on the capacity of the slashing installation and the speed required to dry the warp needed for the mill's operation. When visiting most slasher rooms, I find that great carelessness exists in the proper treatment of the warp. If the average warp dresser realized how much a warp is injured by drying at high temperature, he would insist that sufficient slashers be installed to permit him to dry his warp without more than one or two pounds of pressure on the slasher drum or a temperature as near 215 degrees F. as possible, because every pound, in fact every degree, above this temperature works havoc with the starch on the warp. A baked warp is brittle, ties and weaves poorly and gives inferior cloth. For ideal conditions the drum should be heated not much over 215 degrees F. with one or two pounds pressure and the speed of the drums set so as to leave approximately eight per cent moisture in the warp. When the warp is dried in chambers, as is sometimes done, the temperature must be carefully regulated. I cannot think of a better investment for a mill, be it for cotton or any other fiber, than sufficient and proper slashing equipment to make it possible to dry the warp at the lowest possible temperature. In no case over five pounds of pressure should be used if real good weaving is expected.

Some warp dressers think that by weighing a set before and after sizing they get the percentage increase in weight representing the additional size. This would be correct if the amount of moisture before and after sizing were the same but in numerous samples of warp I have analyzed, I have found anywhere from two per cent to fourteen per cent of moisture. Suppose a warp contained eight per cent of moisture before sizing and two per cent after sizing, it may show a regain of only four per cent and yet actually have ten per cent of dry added size, the analysis before sizing showing:

Cellulose 90%
Water 8%
Ash and Fats 2%

and after sizing:

Cellulose 86%
Water 2%
Starch, sizing, etc. 12%

This warp has been dried far too much and with the proper amount of moisture should analyze:

Cellulose 81%
Water 8%
Starch, sizing, etc. 11%

This would then show about a ten per cent regain. On the other hand, a warp fairly dry before sizing might show scarcely

4% Moisture
94% Cellulose
2% Fats and Ash

and after sizing:

14% Moisture
10% sizing, etc.
76% Cellulose

If satisfied with weighing, the above warp before and after sizing the warp dresser may think that he has increased the weight of his warp 20 per cent which appears to be so but in reality he has only added no more than 10 per cent of dry sizing ingredients to his warp.

The above emphasizes the advisability of making moisture tests before and after sizing at regular intervals. These tests are simple and require no considerable technical skill.

After testing the warp for moisture, it may be tested for total size as follows:

About ten grammes of the warp are weighed, the moisture determined as previously indicated. The warp is then put into a pint beaker half full of hot water and brought to a boil. This water is poured out and the warp rinsed once or twice with cold water, this preliminary treatment removes soluble salts. The warp is then boiled with one gramme of hydrochloric acid diluted in 200 cubic centimeters of water for thirty to forty minutes. This treatment hydrolizes the gums and fats. The gums are readily washed out through rinsing once or twice with pure water. The warp is finally boiled with one gramme of caustic soda dissolved in 200 cubic centimeters of water. This will readily saponify the fatty acids liberated by hydrochloric acid from glycerides and emulsify oils not readily saponifiable. The warp is again rinsed two or three times with pure water. This treatment of water, acid and alkali will remove practically all sizing ingredients either through solution or mechanically. It is then sufficient to dry the washed warp at 200 degrees F. until weight remains constant to obtain the percentage of size to cotton.

The estimation of fats including waxes, oils, glycerides and hydrocarbons is arrived at by putting a weighed quantity of the warp in a soxhlet extracting apparatus and extracting with ether or petroleum spirits, which distilling from the flask and passing through the tube after condensing in the condenser, after a sufficient period extracts all the fatty matter from the warp. This solvent is evaporated and leaves the fats which are weighed and calculated for percentage.

The identification of these fats when in complex mixture is no child's play and it takes an expert of unusual skill to determine even approximately the nature of a mixture of several fats and waxes.

Mineral Matter. Ten grammes of the warp are weighed and incinerated in a platinum or porcelain crucible. In calculating the weight of mineral matter it should be borne in mind that cotton naturally holds approximately about one per cent of mineral matter. The determination of the composition of this ash may be a tedious systematic qualitative and quantitative analysis. In order to avoid a great

deal of trouble, the textile chemist too often looks only for a few ingredients that generally occur in most sizings. A complete systematic qualitative analysis is a matter taking several days of the time of a skilled chemist if the size is of a complex nature and is of interest only in exceptional cases.

An analyst is as apt to be able to say that a sizing compound will do a certain thing from an analysis as he will be able to say whether a dead man was good or not after determining the proportions of hydrogen, carbon and oxygen his body is composed of. The application of a compound is the only way to prove its value.

Weaving Division Meets at Anderson

An important meeting of the Weaving Division of the Southern Textile Association was held in Anderson, S. C., on Friday, June 18th. Its value lay doubly in the fact that the largest number of men ever attending any sectional meeting were present, and the additional fact that a very definite step toward the Association's plan of standardization work was achieved.

There was no round-table discussion, such as has characterized the meetings in the past, at the Anderson meeting, and for that reason this report will occupy comparatively little space. The entire day was devoted to an initial endeavor to establish the first move toward some form of foundation work for the proposed standardization efforts of the organization. While no specific results of a definite character came from the meeting, it is felt that such accomplishments as will be reached along the line of establishing standards and tolerances for cloths of different constructions, insofar as the Association is concerned, can be dated from the groundwork laid at the weaving division meeting last month.

In reporting the Anderson meeting, perhaps it will be apropos to recount a few of the developments leading up to it. Some time ago, the Association officers, recognizing the comparative lack of definite standards in the textile industry, conceived the idea of ascertaining, insofar as possible, the majority practice among the members' mills regarding both manufacturing and also allowances and tolerances made in the finished manufactured product. Their plan was to formulate a basis representing the generally accepted practice in each case, to be used as a starting point in developing standards; and also to represent the opinion and practice of the practical mill man in regard to each different point.

It was felt that if the Association, fortified with information showing what is actually being done in the larger number of mills represented in its membership, could present such figures through the proper mediums, that in cooperation and collaboration with the other interested factors in the industry, the leaders might definitely work out tentative standards subject to acceptance by the trade at large. In other words, it was pointed out, with a few special exceptions, there exist no definite general standards as relates to textile products and practice, and this would offer a means for arriving at such allowances and tolerances.

Accordingly the Association began actively to cooperate with the American Society for Testing Materials, and other recognized bodies devoted to standardization, and definite steps toward the materialization of the plan were made.

The first direct action taken was at the Meeting of the Carding Division, held in Spartanburg, S. C., on May 7th, when a comprehensive compilation of present practice as regards speeds, drafts, twists, production, lay-outs, etc., for various counts of yarn was made under the direction of Chairman Corn. This information was secured from the men present, representing a large number of mills on yarns ranging from the coarse counts to the fine knitting yarn numbers.

The Anderson meeting of the Weaving Division followed, it being conducted under the leadership of L. L. Brown, general superintendent of the Clifton (S. C.) Manufacturing Company, who is chairman of the Weaving Division.

An attendance of some 350 men greeted the chairman when he opened the meeting, which was held at the Anderson Country Club, beginning at 10:00 o'clock Friday morning. Mr. Brown explained that in preparation for the meeting, he and his associates had secured from a large number of different mills in the vicinity, samples of cloth. Print cloth constructions, 64x60, 68x72, 72x76, and 80x80, were the only numbers considered at the Anderson meeting. Mr. Brown stated that he had secured cuts which, by the mill's own method of grading and inspecting, were just barely on the line between firsts and seconds; that is, some were just good enough to get into firsts, and others just barely defective enough to fall into seconds, according to the respective mills' system of inspection.

These samples were laid out on tables in the club-house yard, with no identifying marks except a serial number given by the chairman on them. Each superintendent, overseer of weaving, and overseer of the cloth room, and others present qualified to inspect the cloth, was given a pad containing numbers corresponding to those on the cuts, and the entire morning was spent by these men in going over the samples, and each man graded each sample either "first" or "second" according to his own opinion and practice.

During the luncheon period, the chairman compiled the various gradings, showing, for each sample, how many men had graded it as a "first" and how many had classified it as a "second," and the afternoon session was spent in discussing this compilation, and also in bringing out the ideas of the different men as to the best methods by which to proceed with the standardization work.

This compilation revealed the very wide differences in the practice of grading which had been anticipated by the leaders, since it was shown that in a number of the samples, as many classified the goods as "seconds" as graded them "firsts." In some cases, there was a decisive majority on one side or the other. Also, some samples received practically unanimous classification as either "first" or "second," with a few dissenting opinions on the opposite side, as the case may have been.

A complete report of the findings at the Anderson meeting will be made at the Association's annual meeting at Tybee Beach, Ga., on July 16th and 17th. It is believed that the foundation laid by the engendered interest will prove valuable in the Association's further work. Print

cloths were selected as the first object of the work, because of the number of mills in and near Anderson manufacturing them, but it is planned later to extend the scope of the work to other fabrics and yarns.

One pertinent suggestion made at the Anderson meeting was that the Association place on display in some of the leading textile centers, the samples of goods selected, and invite the mill men in the vicinity to visit the display and make a careful inspection of the cloths and submit to the chairman a written report of their classifications of the different samples. It was indicated that this would be seriously considered by those in charge.

It was brought out specifically that such conclusions as may be arrived at by the Association in this standardization work, will represent only the viewpoint of the practical men composing its membership, and that they will in themselves not be considered as definite, authoritative or permanent. It will be necessary to subject any recommendations along this line to the financial executives of the mills through the various representative associations; and later to collaborate with other recognized agencies, before definite standards are laid down. It is believed by Association leaders, however, that in thus presenting the operating executives' viewpoint on the subject a material progress will be made toward the establishment of the needed standards for textiles.

Georgia Cotton Manufacturers Meet

A meeting with a program of constructive activity and resultful work was held in Atlanta, Ga., on June 21st and 22nd by the Cotton Manufacturers' Association of Georgia, as the 26th annual meeting of the organization. A good attendance and a pleasing entertainment program added to the success of the occasion.

The keynote of the meeting was the consideration of problems affecting the industry today, revolving around the Cotton Textile Institute plan being sponsored by President George S. Harris and other leaders in associational work. Other features, however, were of much interest and importance.

On Monday evening, June 21st, a preliminary discussion meeting was held at the Biltmore Hotel, to discuss several points of especial interest to the Georgia textile industry. President Harris, who presided at all of the sessions, opened the meeting, announcing first that the subject of "Safety in Our Mills" would be taken up.

The first speaker was Sharpe Jones, secretary of the Industrial Commission of Georgia, who declared that his organization had very little to do with the safety conditions, except in approving the rules adopted by the mills and giving them authenticity and authorization. He explained that while he had received few calls from mills to approve rules, this lies with the plant itself. When the commission approves a safety rule adopted at a mill, he pointed out, if an employee is injured as a result of its violation, the mill is not liable and the employee cannot draw compensation for the injury. He emphasized the importance of establishing the rules, and having them approved, and then also of a strict enforcement without which they become useless.

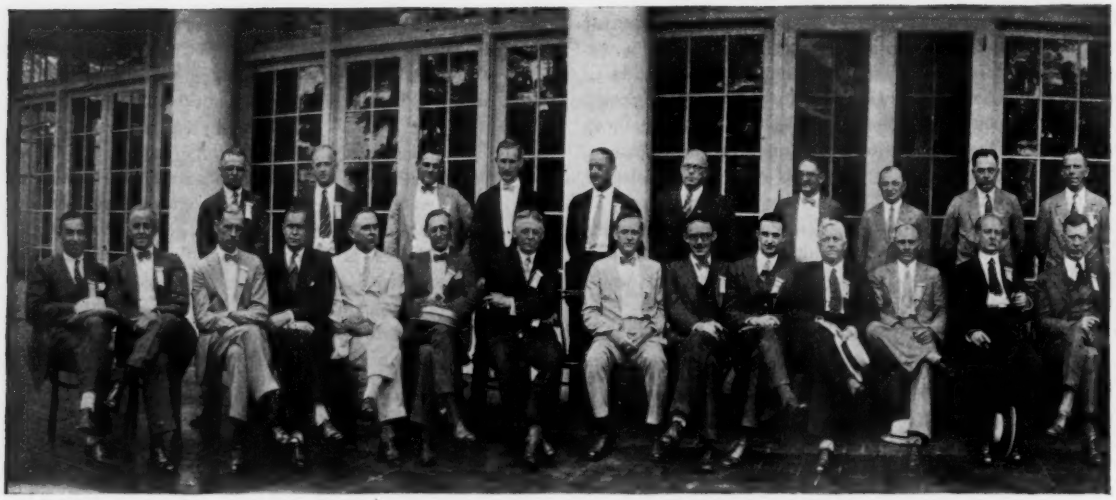
Miss Mary Dickerson, secretary of the Tuberculosis Association of Atlanta, was the next speaker, discussing safety from the standpoint of health conditions. She declared that she had had considerable contact with cotton mill villages, and finds that there is an increasing interest on the part of the concerns in the health of the people who are running their machines and producing their output. However, she said, it is important to face the facts, and know just what the conditions are, before attempting to solve the problem. Too many go along, with insufficient information, she stated, citing the case of a mill for which she was conducting a survey, saying they were unable to tell her how many people were absent from the plant because of sickness.

Cotton mill people, she said, do not have any especial group "health-consciousness"; as their attitude is rather negative than positive. For instance, she said, the average woman, when asked how she is feeling, will reply "Just tol'able"; and said it seemed impossible for them to be any better than "just tol'able."

The manufacturers must change this attitude, and create a "health consciousness," said Miss Dickerson, and this is

George S. Harris, Re-elected President.

possible by studying the kinds of food, hours of labor, type of recreation, and other factors influencing the lives of the operatives, in developing the under-nourished, etc.; and in this work every executive must become a "health enthusiast." She suggested the advisability of training the students in technical schools who go into the mills along the lines of health education, as well as with regard to the raw material and machinery. To secure the results, a group cooperation is necessary, she said, and this must be done by working from the bottom up and the top down; she referred to the article in a recent issue of COTTON regard-



ing "barn-raising," quoting it to show that the principle of this old cooperative plan can still be applied and must be used for the proper results.

There was a brief discussion with Miss Dickerson following her remarks, after which the manufacturers took up the subjects of "Child Labor Law of 1925," and "Compensation Insurance" for discussion. After this discussion the session was closed.

On Tuesday the activities of the convention were transferred to the Druid Hills Golf Club, where the morning session was opened at 10 o'clock by President Harris. Following the invocation by Dr. S. R. Belk, the address of welcome was made by Norman E. Elsas, secretary of the Fulton Bag & Cotton Mills. M. M. Bryan, secretary of the Jefferson (Ga.) Mills, who was scheduled for the response, was not present, his paper being read by Secretary W. M. McLaurine.

The president next announced the appointment of committees; the nominations committee consisting of the ex-presidents of the association, and the resolutions committee being composed of John H. Cheatham, chairman, N. E. Elsas, W. N. Banks, Clifford Swift, S. A. Fortson, C. H. Newton, and J. J. Scott.

The next address was delivered by Dr. Andrew J. Soule, president of the State College of Agriculture, University of Georgia, Athens, Ga., who made an appeal to the manufacturers for assistance in connection with improving the staple and grade of cotton in Georgia, and in consuming in the mills of the state the staple raised within the state. He cited figures showing that under present conditions a large percentage of the cotton spun in Georgia is secured from other states, declaring that such a condition should not exist, and that with the proper education, a sufficient amount of cotton to supply the needs of the mills could be cultivated in the state.

He pointed out that the improvement of the present agricultural condition must come, not from more legislation "to aid the farmer," but through the concerted action of businesses and industries, in which work the textile manufacturers held a very important position. He made a plea for a closer cooperation between his institution and the mills, and for the support of the manufacturers in the program of research and educational work which his school is endeavoring to conduct among the farmers.

W. G. Sirrine, president of the Southern Exposition, Inc., spoke briefly with reference to the forthcoming Southern Exposition in Madison Square Garden, New York City, declaring that the time is ripe for the southern cotton manufacturers to exploit their products to the world through this medium. He suggested the idea of having the cotton manufacturers and commission merchants take a suitable space for displaying their products to the thousands who will attend the show.

Mr. McLaurine, secretary of the Association, next made his annual report, showing the extensive activities of his office during the past year in connection with coal buying, legislation, and other phases of work.

The annual address of the president, George S. Harris, was the concluding feature of the session. Mr. Harris devoted the larger part of his address to a discussion of the Cotton Textile Institute. His remarks follow in part:

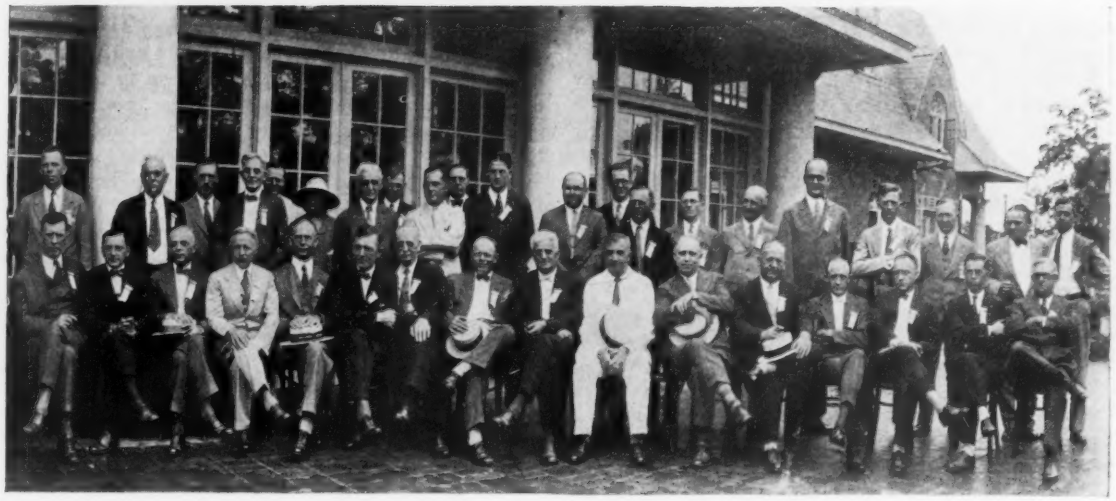
President's Address.

"In reviewing the year which this convention brings to a close, it is immediately apparent that we have not wanted for activity in matters of interest to this Association, and it is with a mixed feeling that I make you this, my final report as your president.

"The Cotton Manufacturers Association of Georgia has, during the past two years, become a vital part of my life and it is with difficulty that I picture myself shelved among your "X.P's." This, however, must be and in retiring I do so with the hope that I have in no way been a disappointment to you.

"I have felt keenly the responsibility of the office from the day you honored me with it. To have been elevated to such a position by my fellowmen of my own native State has meant more to me than words will express, and I have addressed myself throughout the two years to the task of advancing wherever and whenever possible the interest of the association. How well I have succeeded is to be judged by you.

"As I told you a year ago, there has been work to do a plenty, as well as work ahead, and I hope that we will at this meeting, if nothing more, imbibe a little more of the nectar of cooperation. So many of our members fail to take the association seriously and thereby retard its progress. There has always been a feeling of individuality in our entire industry that has made it very difficult to



advance association activities not only in Georgia alone but in other sections. It seems to be the thought that the survival of the fittest is the *only* law that must govern. This, my friends, to my mind is the one great obstacle to our progress and happiness. Survival of the fittest, yes, but this is not the *only* law that should govern. History of man fails to disclose where it was ever possible to survive when this law *alone* governed, but do not misconstrue my words so as to believe that I am advocating principles of socialism. To suggest setting up a single condition enabling the weak to ride the strong is far from my thoughts. In the language of Dr. Dyer before the Atlanta meeting, 'we are living in the days when there is no room in textiles for oysters. Only eagles will thrive, but even the birds of the forests have their "sentinel" and when he points to danger, the flock follows his guidance.' In referring here to the strong and the weak, I am not comparing a large mill as opposed to a small mill. While I do believe that sooner or later consolidations in textiles will be forced, efficiency counts the same per spindle in a mill of 10,000 spindles as it does in a mill of 100,000 spindles.

"I want to see two items in the present set-up corrected.

"I want to see, first, the game played fairly and, second, certain group activities enhance the happiness of all. To my mind, our industry has become permeated with destructive competition to a terrible degree. This has, from year to year, been practiced until we find ourselves in a death grip that promises to tear down the entire structure. We are so busy trying to destroy that we have no energy left with which to construct. It appears that our whole object seems to be the destruction of our competitors. Hence, the term 'destructive competition.' Isn't it about time we take off a trial balance and see the result of this policy? Just how much progress have we made during the past five year period under this general scheme? Some have gone forward, yes, but how much more progress could these same mills have made if less attention had been directed to destroying others and had their entire efforts been directed to the common goal.

"In football, that wonderful game that fascinates us all, there has been correctly applied a very severe penalty for 'holding' which illustrates well the common fault in cotton manufacturing. We have placed this game high upon the pedestal of honor and today for this very reason it stands out among athletic sports. You can easily recall your feeling when your favorite team, after continued successful drives through center and around ends, advanced the ball to their opponents' ten yard line; when the umpire stepped in and walked back with the ball twenty or thirty yards. The scoreboard flashed 'Penalty Holding,' progress retarded. The hard gallant work of the entire team gone for naught because one man attempted 'destructive competition.' Nothing more clearly illustrates the prevailing practice in cotton textiles when we are so busy holding our competitors we make no progress for ourselves. I like to look upon business as a game and my confidence in my fellow man leads me to believe that at heart all men want to play the game fairly but, in our enthusiasm, we are forgetting the rules. This is why I think we have definitely reached a point where a check should be taken for the good of all and, hence, the proposed Cotton Textile Institute.

"I have recently illustrated the cotton textile industry as a ship sailing the seas of commerce today, no navigating bridge, no skipper, and, if you please, not even a rudder. In fact, an antiquated ship floundering at the mercy of the waves, drifting to destruction. In contrast to this, we build a bridge—out forward—extending well beyond the side lines, giving access to a full view not only of the ship both forward and aft, but to the sea as well, from horizon to horizon, in all directions. This bridge we call the Cotton Textile Institute. On this bridge we place the skipper of the ship, the directing head, the director general. Then last, but most important of all, we build a well constructed rudder—common sense cooperative competition. We might call it 'constructive competition.' The ship then becomes a modern ship well able to drive ahead through the storms of commerce. It is easily seen that our ship is helpless if any of the three items is omitted. In fact, our progress is dependent directly upon the strength of any one of the three vital elements. Our skipper—Director General—without a navigating bridge would not only fail to see the storms ahead, but would not be in position to direct his craft. The bridge—Cotton Textile Institute—will be built upon facts. This means vital statistics from every cotton manufacturing plant in America fresh from the records weekly. It means production, sales records, unfilled orders, stocks and any other vital information found

necessary by the Institute to enable the Director General to chart the course in advance. Contrast this to present-day methods—approximately 2200 mills, no one with any knowledge of what the other is doing.

"With the bridge designed and constructed, we have the task of placing in command a *man*. Some have attempted to chill our enthusiasm with the suggestion that we are attempting the impossible; that this would require a super-man and such is not available. On this I take issue with our critics. There are men available, fully competent to direct our ship, provided we build in advance a good strong rudder and here is where you and I come into the picture. No Director-General, no Textile Institute can be a success unless we back it up with our full support.

"The first step toward the construction of this rudder, that we call 'common sense constructive competition,' is for all to fully realize that our prosperity and progress depend on our learning to think more in terms of the group and less of our individual problems. This does not mean that we should attempt to remove the element of competition in our business. We have laws governing such efforts but law or no law, we would not have it otherwise because without this competition, the game would not be worth playing. It is this that holds our interest and makes for progress; in fact, every normal man enjoys a fight so long as it is played fairly according to the rules. I am not talking now of that kind of competition; I have reference to 'destructive competition,' to the guerilla warfare that is common in our market whenever the off-take begins to lag behind production. Immediately ruthless price cutting is started that soon carries the margin of profit into red ink for every one, yet no one seems to *feel* responsible for it. We justify these price reductions by meeting some one else's price. It seems that no one in our market ever makes the initial reduction; yet we chase ourselves around a vicious circle making sales at lower and lower prices to prevent our competitor taking business when often the hardest blow we could give him would be to let him have the business.

"Furthermore, it has been demonstrated that this practice has thrown upon our customers a severe load in the way of inventory losses. We will some day learn that the net result of such merchandising is a net loss to every element of the trade from mill through to the consumer, and it is the beginning of this realization that has been the cause of such keen interest in the proposed textile institute.

"Our industry in the south has had a very rapid growth. We built mills merely for the reason that certain communities felt the need of a payroll, until we reached the war days when suddenly we found ourselves attempting largely to supply the world. With millions of soldiers in the field clad in cotton, the off-take from the mills was enormously beyond normal. After the war, when we finally settled down in the fall of 1919 and early 1920, we found in the natural channels of domestic commerce a dearth of cotton goods everywhere. We met this situation not only with new spindles but preparation for day and night operation, both in northern as well as southern mills. This extraordinary demand ceased as suddenly as it developed and since 1921, we have passed from a short period of prosperity to a like period of depression, often the losses of the periods of depression offsetting the profits of the periods of prosperity.

"We have had all of this brought home to us at least once in each year for the past five years and the wonder to me is, how many lessons will we have to take before we learn? How much further will we go before we, as a group, are fired and men placed in our positions who have the necessary vision to make the correction? Are we in textiles to wait for the next generation to do this thing for those who have entrusted their capital to us? Some one will do it later if we fail now, because it is going to be forced by economic conditions in the industry; this will be by strangulation and very painful.

"Our remedy looks simple. Through the proposed Textile Institute you will have placed before you, in condensed form, certain vital facts and figures at frequent intervals by which you will know the exact status of your particular production. It is also proposed that the Institute can publish to you and your trade a weekly price index figure as a basis for your market transactions. This price index figure will indicate the price at which your goods should sell after the Institute has given consideration to all elements affecting prices. Naturally, if you continue to produce beyond the off-take or expected demand in your particular line, the law of supply and demand will necessitate the institute lowering the price index. Contrast this with the present, when you are basing your judgment upon the meagre and often incorrect information at your command. You often know *after* large unsold stocks have been accumulated; you know *after* prices have been reduced to or below your cost. You know innumerable things when it is too late to avoid losses. I think we know that if we are all wise enough to report fully and honestly, we will have information in the aggregate that could be worth millions annually to the mills as a group. This does not in any way affect the differential between one mill and another. If you think you have certain advantages that are yours for certain good reasons, you are not giving up this favorable position but you are putting your competitor in position to avoid doing things, through ignorance, that have cost you enormous losses in the past. You cannot kill him, my friends; you may fight him to a finish and break the corporation but the physical property stands and the product will continue to meet yours in the market unless you buy his plant and shut it down.

"This 'textile institute' suggestion carries many other features, such as group advertising both at home and abroad, as you have seen so effectively handled in other industries; research work in many lines including a continual search for new uses for cotton cloth and, in fact, I could talk all day about what this institute could do if supported by even 75 per cent of the mills of America, but this is not necessary. It is inconceivable that any manufacturer could have failed to notice the tremendous value of the institutes now operating in several of our major industries and, in the face of this, can we possibly afford to continue our textile industry without such a central institution? I believe that because of certain conditions, a cotton textile institute is more essential than any other. Properly organized and functioning, it should have a stabilizing influence on our markets from cotton to the consumer; it is easily conceivable that this institute may be made to serve the man back on the farm who produces our cotton. He also has suffered for years for the want of intelligent guidance and no institution exists today that is in position to see his immediate future as would be a cotton textile in-

stitute fully supported by all departments of the industry. No one is more interested in the success and well-being of the cotton producer than is the manufacturer and both farmer and manufacturer alike are interested in reducing to a minimum the fluctuation in the price of cotton.

"The basic idea in all of this is to set up machinery to gather information from all sources, compile it and send out vital facts and figures to points where they can best serve.

"In these proposals, we do not believe that we are suggesting anything unethical. We do not propose any thought of setting up machinery with which to take advantage of anyone. We believe that through this central agency, it will be possible to equip management in cotton textiles to more intelligently direct the industry as a whole. From the trade standpoint, we believe it possible to straighten out the price curves and avoid the enormous losses our customers suffer through the present antiquated methods of merchandising. We believe that through group activities, directed by the institute, a new and better sentiment toward cotton and its products can be created not only at home but abroad. The public, especially the female of the species, has thrown us down for other fibers and it is only through such group activities that we may hope to regain our lost position.

"I may have painted this picture a little dark but it is common knowledge that there is much room for improvement and I am only trying to do my bit toward placing our industry 'out front.' Whether or not the textile institute, as such, is adopted is a question for the future but some change is in the offing; of this I am certain, and once definite plans are agreed upon, I want Georgia, my own State, to be among the first to stand solidly for it."

Mr. Harris stated that some critics had declared the plan of the cotton textile institute was not feasible because it would be a violation of the Sherman law, but he read the decision of the U. S. Supreme Court in the case of the Maple Flooring Manufacturers Association against the United States, granting the association the privilege of opening and fairly gathering and disseminating information as to cost, volume of production, stocks on hand, merchandise, etc. He also quoted from an article by Herbert Hoover, wherein the secretary of commerce lent his approval and support to such activities, and emphasized the need for such action in present-day commerce.

A luncheon was served the delegates at the club at 12:30 o'clock, following which those desiring to golf spent the afternoon on the links, while others remained around the club talking shop and other things.

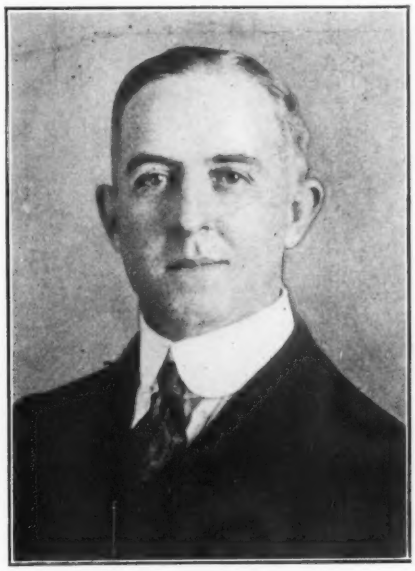
The Banquet.

The concluding feature of the convention was the annual banquet, held in the ball room of the club on Tuesday evening. It had been planned to have no speeches at the banquet, but because of the crowded condition of the morning program, the discussion of the Cotton Textile Institute by William J. Vereen, and H. R. Fitzgerald, was held over to the banquet. Mr. Fitzgerald was the first speaker, outlining the conditions existing in the industry at the present time, and enthusiastically endorsing a plan such as the proposed institute for their solution, provided an entire cooperation is given by the mills. Mr. Vereen told briefly of the work of the preliminary committees up-to-date.

Clifford Swift, of Columbus, made a happy speech presenting to Fuller E. Callaway, through his son, Cason J. Callaway, a loving cup in behalf of the Association as a token of its esteem and appreciation to Mr. Callaway for his untiring efforts in behalf of the industry.

The report of the traffic manager was read by Secretary McLaurine.

John H. Cheatham, chairman, read the report of the resolutions committee, and resolutions were adopted endorsing the effort of the steering committee of the National and American Associations in working out some definite plan of stabilizing the industry and clarifying the marketing problems; the credit union law; the efforts of the State College of Agriculture, with recommendation that



W. M. McLaurine, Secretary.

the board of directors consider a contribution to their funds. Two resolutions of regret at the death of Rogers W. Davis and Samuel F. Patterson were adopted by rising vote.

Mr. Vereen made the report of the nominations committee, which was that all incumbent officers be re-elected, as follows: President, George S. Harris; vice-president, S. Y. Austin; treasurer, T. J. Callaway; secretary, W. M. McLaurine; and traffic manager, C. W. Chears; and directors, Clifford Swift, D. A. Jewell, Jr., W. D. Anderson, D. W. Anderson, L. L. Jones, W. H. Hightower, and Allan Little. The report was unanimously adopted. Mr. Vereen then presented Mr. Harris, on behalf of the association, with a gold medal bearing the seal of the association, as a token of appreciation for his continued service and activity.

An enjoyable musical entertainment program was the next feature, which was followed by dancing until a later hour, and the convention passed into history.

Morehead Manufacturing Co., Detroit, Michigan, have just issued Catalog No. 15, prepared in convenient form and size for filing in standard files. The company manufactures return, condenser, vacuum, non-return and variable pressure, non-tilting steam traps, and the booklet gives up-to-date information with reference to their various products.

Towels and Toweling

BY T. WOODHOUSE AND A. BRAND.

Drawing-in and Reeding.

When the warp has been prepared as indicated in the foregoing section, the next steps in the process involve the drawing of the threads through the mails of the harness or healds, and the passing of the same threads in suitable groups through the splits or dents of the reed. The drawing-in of the threads through the mails of the harnesses is determined by the type of fabric and the draft requirements of the design and the weaving plan, while the number of threads in each split or dent of the reed is

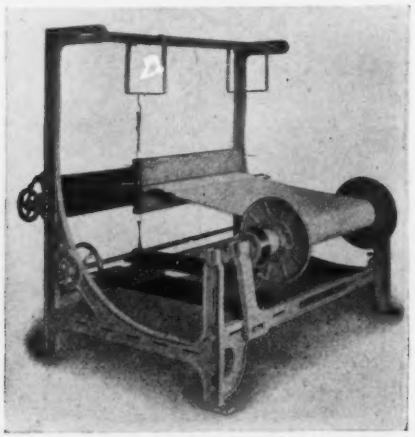


Fig. 121.

sometimes determined arbitrarily, sometimes by the requirements of the weaving process, and sometimes by the necessity of developing or accentuating special features in the fabric structure. Typical examples of these varied requirements have appeared in previous sections of these articles, and need not be discussed further at this stage.

In the production of toweling from cotton yarns, and when the new beam is to follow a similar beam in the loom,

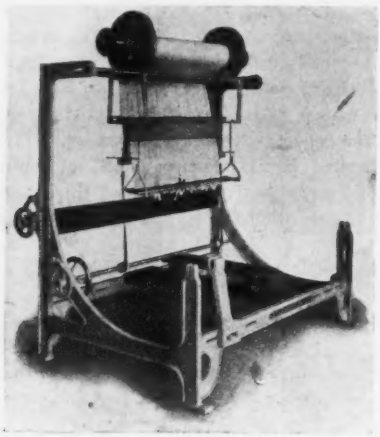


Fig. 122.

the new warp may be joined up to the old one by the process of twisting-in. This operation may be, and often is, done in the loom itself, especially when a considerable number of harnesses is employed in the loom, but, in other cases, the twisting-in operation is performed in a frame specially built for the purpose. This method enables the new warp to be prepared before the old one is finished, thus saving time, besides giving the operative an opportunity of thoroughly cleaning the inside parts of the loom, and also enabling the drawers-in or twisters-in to clean and repair the harnesses before they are gaited up in the loom. In very similar circumstances when linen warps are used, the threads are tied-on instead of being twisted-in.

When the new warp is unlike the old one, either in number of threads or in the order of the draft in the harnesses, the drawing-in and reeding operations are performed in the customary manner. A combined looming and twisting-in frame, suitable for all general purposes in the manufacture of towels and toweling is illustrated in Figs. 121 and 122. The frame has been specially designed for the combined purposes of twisting-in, looming, and

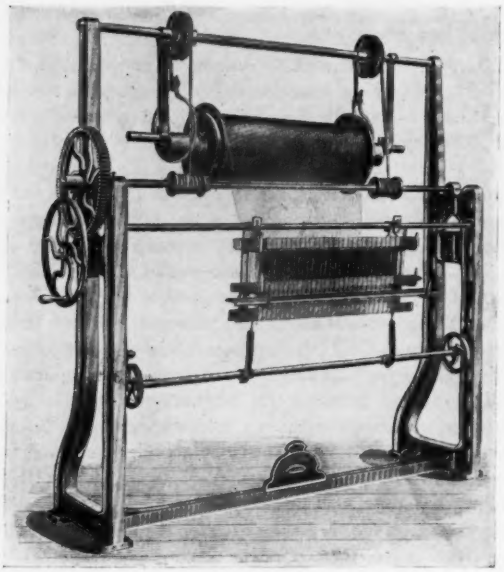


Fig. 123.

sleying or reeding. The frame as illustrated in Fig. 121 is arranged for twisting in, while Fig. 122 shows it mounted for the ordinary processes of drawing-in and reeding. The frame is made of cast-iron, and has a polished wooden roller on which is mounted a ratchet wheel whereby the warp is kept in proper position during the operation of twisting-in. This ratchet wheel, with its retaining pawl, is seen at the left in both Fig. 121 and Fig. 122. A shaft, fitted with a hand-wheel and with a second ratchet wheel, is also provided for use with the usual adjustable harness fixings when drawing-in.

The frame as illustrated is sent out provided with a polished wood reed-case, a sliding seat for the operator, and a tray to hold sundries such as scissors, drawing-in hooks, reed hooks, etc.

Figure 123 shows a similar type of frame. It is only suitable for drawing-in and reeding, and not for twisting-

in, but it is fitted with a beam lifting apparatus which facilitates the raising of the warp beam into the high position necessary for easy manipulation of the threads. This mechanism, actuated by the hand wheel and gearing at the left, is clearly visible in Fig. 123, and need not be enlarged upon here. The lower shaft, fitted with a handwheel at the right, and with a ratchet and retaining pawl at the left, is for the purpose of putting tension upon the harnesses.

Weaving.

Except when it is required to produce special effects in the cloth, such as in terry fabrics the looms used in the production of towels and toweling are very similar in design and construction to those used in the manufacture of corresponding weights of ordinary cotton, linen and union textures. In addition to the usual variations of the chief motions of the loom, however, are found various special motions which more particularly adapt the loom for the production of separate towels. Included in these special features are various forms of fringing motions, measuring motions, knocking-off motions, etc., typical examples of which will be more particularly noted in due course.

According to the design of the fabric, or range of fabrics, required, the looms are fitted with a variety of shedding devices, including negative and positive shedding

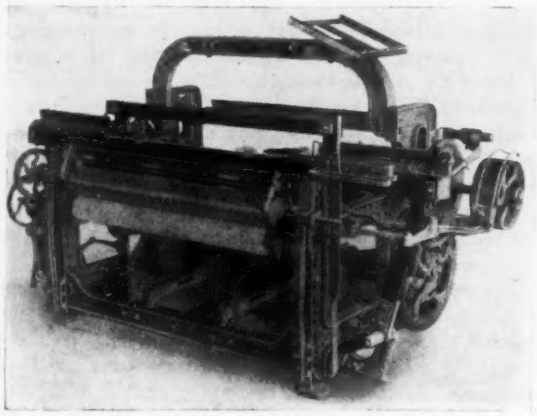


Fig. 124.

tappets, ordinary dobbies and jacquards, cross-border dobbies and jacquards, cardless dobbies, etc. Both overpick and underpick motions are used, the latter chiefly for light fabrics, while box motions of the rise-and-fall type or of the revolving box type are brought into use for heading or cross-border work. In many cases, these box-motions are controlled or partly controlled by the dobby or jacquard, so that it is impossible for the order of picking to get out of step with the order of shedding.

Uptake or take-up motions are usually of the positive type, working in conjunction with negative let-off motions, and in addition there are the usual accessories, such as brakes, weft-forks, temples, warp stops, loose reeds, protector motions, etc.

A typical loom for medium towel fabrics might be made to the following general specifications:—overpick, fast reed; planed framing and cross rails; positive take-up motion; iron take-up roller covered with perforated steel strip; automatic motion to stop the loom on failure of the filling, or exhaustion of the filling-supply; set of change pinions to vary the number of picks per inch; wrought-iron crank shaft; brass bushes in connecting arms; brake, applied automatically when loom is stopped through any cause, and released automatically on re-starting; cloth roller of wood with steel arbor and hooped ends; chains and levers to keep cloth roller pressed against take-up roller; steel tube yarn beam with malleable cast-iron or pressed steel flanges, and with cast-iron ruffles or drag-heads; weights, levers and chains for let-off motion; double-rollered self-acting temples with rods and springs; polished wood sley-top or reed-cap; tight and loose driving pulleys; polished wood breast-board or cloth protector; fixed back rail; measuring and knocking-off motion; foot pedal for fringing; etc. The loom might be 32-inch reed-space, and fitted with a 16-harness automatic cross-border dobby.

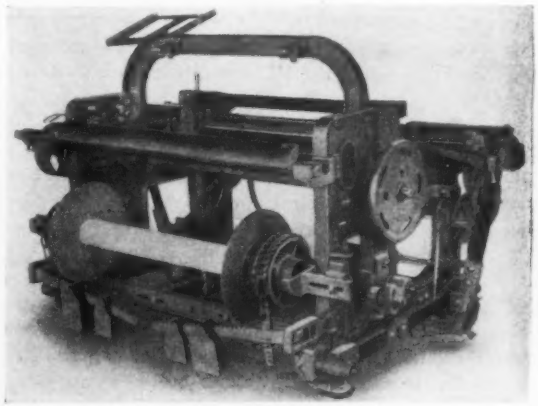


Fig. 125.

A similar loom for Turkish toweling could be to the same general specifications with the following exceptions: Take-up roller of wood, covered with emery; two wood yarn beams, with single flanges and ruffles, one beam at the top for the pile warp, and the other at the bottom for the ground warp; turned ruffles for the top beam; single-rollered temples; and an approved form of reed-motion for terrying. The loom might also be fitted with a 16-harness automatic cross-border dobby, and be about 36-inch reed-space, suitable for towels up to about 28 inches wide.

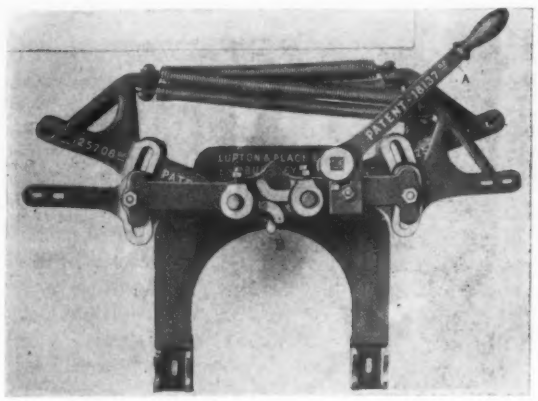


Fig. 126.

A linen loom suitable for certain classes of light toweling capable of production of tappets is illustrated in Figs. 124 and 125. The former figure shows the front of

the loom and the driving end, while the latter illustration shows the back of the loom and the opposite end. The loom illustrated is made by Robert Hall & Sons (Bury) Ltd., Bury, and is arranged for plain weaving; the shedding is performed by negative tappets, the motion of which is made positive by the top roller mounting, of which only the shaft and stepped bowls are seen in Fig. 124. The shuttle is controlled by an underpick motion; the front of one picking arm with its actuating parts is plainly visible at the right of Fig. 124, while a back view of the similar parts at the opposite end of the loom is seen at the right of Fig. 125.

The take-up motion is of the 5-wheel positive variety, working in conjunction with a negative let-off motion, consisting of weighted levers acting on chains coiled round the ruffles of the beam. All these parts are also seen at the right of Fig. 125. In addition to these principal motions, there will be seen in the two illustrations a weft-fork motion, fast-reed protector motion with flat springs to take the shock of banging-off, an oscillating back beam to relieve the shedding strains on the warp, a tray for a pan to hold cops or pirns, etc.

Supplementary Shedding Motions.

When negative shedding tappets are employed to control the movements of the harnesses, or when a negative dobby is similarly used, some form of supplementary motion is required to make the shedding device completely positive in its action. With weaves requiring up to five

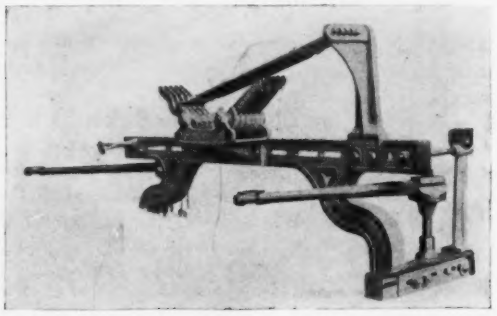


Fig. 127.

harnesses, and in which the same number of harnesses is lifted on each pick, it is possible, and, indeed, advisable, to use top roller mountings, and this is generally done, wherever possible, in the manufacture of towels and toweling.

When a varying number of harnesses is lifted every pick, the usual type of top roller mountings are not suitable, unless for slight variations, and even in these cases extra mechanism has to be introduced; for such weaves, some form of spring top motion or spring under motion must be employed. These are of many shapes; practically all the leading textile machinists have one or more designs of each type included amongst their various specialties.

Figure 126 is introduced to illustrate a patented form of spring top motion, in which the usual toothed levers are replaced by special levers without teeth. The motion is sold under the trade name "Climax," and is made by Lupton & Place, Ltd., Burnley, England. The usual teeth on the inner ends of the levers, the purpose of which is to secure equal motion of each end of the harness, are replaced by single curved lobes of cycloidal contour on their working faces. The lobe is made the full width of the lever to give a large bearing surface, while the cycloidal character of the curved working surface gives a very fair approximation to pure rolling contact, and secures long life of all the parts. Two of these lobes are clearly seen at B in Fig. 126, which illustrates the mechanism with the front supporting plate removed.

The handle A, Fig. 126, actuates a harness leveling device by means of which all the harnesses can be brought instantaneously to one level, thereby facilitating the piecing of broken warp threads and their insertion into the

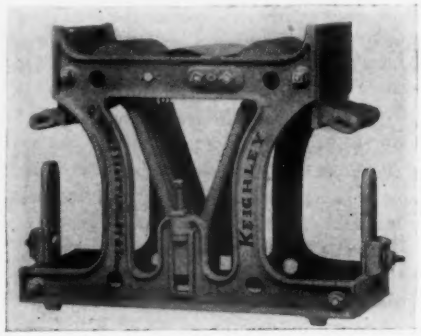


Fig. 128.

mail or heddle eye. The jack levers are provided with double hooks for the springs, so that the user has some choice in fixing the most suitable position for a given spring in a particular loom. Normally, the springs are on the bottom hooks, but, if additional controlling force is found necessary, the springs may have their leverage increased by being altered in position from the bottom hook to the top hook. In extreme cases, two springs per jack may be employed, one on the top hook, and one on the bottom hook. Further variation can be obtained, of course, by using different strengths of springs.

Figure 127 illustrates another type of spring top motion, which is shown in working position, bolted to the top rail (cross rail or bow rail) of the loom. It is arranged for use with inside shedding tappets, and has the main stand in the form of a tray or shallow trough to prevent oil from dropping on the fabric in the loom. This form of motion is adapted for any number of harnesses up to seven, while duplicate sets are used for wide looms.

A very neat and effective form of under motion is illustrated in Fig. 128. In this motion the lower ends of the springs are hooked to an adjustable bar; the front adjusting screw can be seen quite clearly. These adjusting screws provide a means of altering the tension in the springs to any desired degree. The special features of the motion lie in the diagonal disposition of the springs, and in the peculiar curves of the jack levers. As the outer ends of the levers rise with a rising harness, the upper ends of the springs move inwards, and so minimize the extension of the springs. Due to this inward movement and to the shape of the levers, the mechanical advantage of the harness acting on the outer end of the jack is increased as the harness is raised, while, simultaneously, the leverage of the spring is reduced as the spring is extended.

(To be continued.)

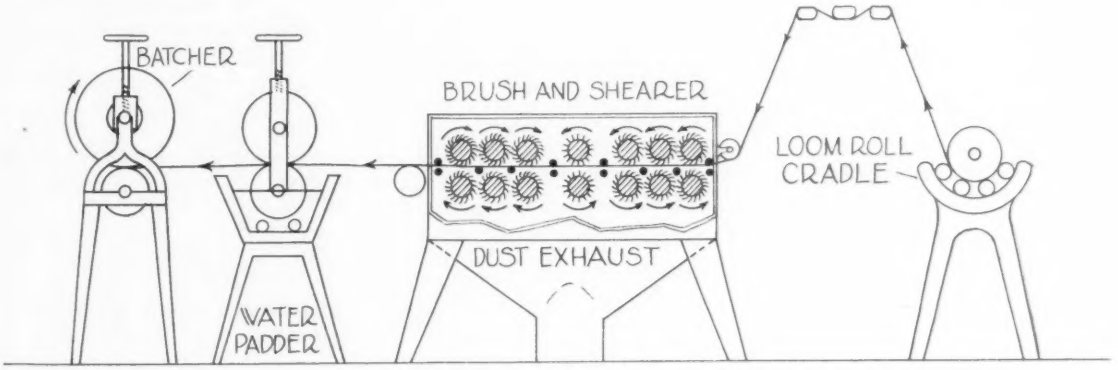
Opportunities are not rare. They are everywhere. What is rare is the quick brain and strong will to make use of them.

Finishing Fast Tan Dyed Awning Goods

BY F. A. ALTER.

With the methods of producing the better type of cotton awning stripe goods of the class discussed in the previous articles on this subject as to dyeing, finishing and manufacture, we now come to the last stage of the entire process of the manufacturing of this material, namely the finishing. This operation should be given the same careful attention that is suggested in all the previous processes.

The rolls of goods coming from the loom in the weaving department, which we will call "loom rolls" for convenience, are conveyed to the last finishing process, which as a rule is in the cloth room or packing and inspection and shipping departments in many plants, and there are sorted into the different styles and patterns in which they are woven, for convenience in handling for inspection and shipments. This is usually accomplished by placing them on trucks or raised platforms which are used for this method. They are then placed, each roll at a time, into a sort of roller cradle at the back end of the finishing apparatus and run into a brushing machine after passing over a set of spreaders and tension bars, which keep the goods in a perfectly level width as they pass into the entering end of the brushing machine.



This brushing machine is composed of a series of rotary brushes, which, working every other brush in the opposite direction to the one next to it, act mechanically upon the dusty, linty and dirty surface of the woven goods and clean it, on both sides, so that, when it reaches the part of the machine where it receives its shearing, it is almost entirely cleared of any loose or protruding fibers or threads which may have been adhering to it. After passing this shearing section, it is again passed through a final brushing, by means of another series of rotary brushes arranged in a similar manner as those in the other end of the machine. This last section of brushes brings the awning goods to the shrinking process of the continuous operation in a clean state, and makes possible this latter operation without encountering difficulties from loose threads, ends, etc., being carried along on the surface of the goods and causing specks to show on the finished goods. In passing, it might be well to mention, that the brusher and shearer is equipped underneath, with a large funnel shaped galvanized iron pan which in turn is attached to a pipe leading to an exhaust fan. This fan operating at a speed high enough to cause sufficient suction to remove all the refuse matter brushed and sheared from the goods and deposit it outside the plant.

Upon leaving the brusher and shearer, the goods now enter a sort of water padder. This consists of a stand, upon which rests a vat of small capacity. This is usually about forty inches long, twelve inches deep and shaped as shown in the sketch of this part, with a smaller bottom width than there is at the top. The top width may be twenty to twenty-two inches and the bottom may be twelve to fourteen inches, and the entire tub may be constructed of a wood similar to cypress or of that particular wood itself. This tub or vat is fitted with a set of two rollers, one on top of the other, the upper one being of steel, very smoothly finished as to its surface, and the lower one of brass, both supported by metal uprights attached to the ends of the vat.

In the bottom of this same vat, there should be a steam coil, of the closed type, for the purpose of heating the liquid contained in the vat, and also a fair sized water pipe should be attached in such a manner as to provide a water supply to the vat.

With these parts of this unit assembled as per the sketch, and with the water at the level indicated, with the lower roll running in the water as shown, this operation is the next step in this continuous process of wetting or shrinking the goods as they come from the brusher and shearer. In running the awning striped goods thus, it is advisable to have the temperature at about 170° F. maintained throughout the running of a series of rolls or lengths of loom rolls, so that the water impregnation may be to such an extent that the goods may absorb only sufficient moisture to bring about the desired shrinkage. It is due to the padding effect of the bottom metal roll, running in water as it does, (about half of this roll is always submerged) that only the underneath part of the goods receive the water. The squeeze however, which is administered by means of a hand screw wheel at each side of the vat and at each end of the top roll, should be sufficient to squeeze out immediately, upon going through between the rolls, any excess water that would be liable to be carried further.

In this moist state, the goods are run onto a batcher which consists of a smooth steel or brass roll placed horizontally between two uprights upon a stand of sufficient height to take care of the goods coming from the water padder. A wooden batch roll of about six or eight inches

diameter is used to wind the goods up on, and when a roll of material of sufficient size for handling afterwards is made, it is placed upon a platform or flat truck, and is then ready for the measuring machine, and from thence it is placed ready for inspection, etc., preparatory to shipment.

What the Southern Mills are Doing

An interesting announcement during the past month affecting South Carolina's textile expansion was to the effect that the Lonsdale Company, of Lonsdale, R. I., which owns the Seneca Company, Seneca, S. C., will double the capacity of the South Carolina plant by the addition of 20,000 spindles and 500 looms. This equipment, with the necessary preparatory machinery, will be removed to Seneca from the Rhode Island plants of the company. To provide for the expansion, a weave shed 132 x 316 feet is to be built, two stories in height, to take care of 1,000 looms and thus provide the present mill building entirely for spinning and preparatory equipment. Also, it is understood, approximately 200 new homes for operatives will be erected. The Seneca plant was purchased by the Lonsdale Company from the Victor-Monaghan Company about three years ago, and the new owners have spent in the neighborhood of a million dollars on the plant. The mill makes two grades of fine sheetings, and has been on double-shift operation for two years. J. E. Sirrine & Company, Greenville, S. C., are engineers for the work on the new mill.

Two opener rooms will be erected at the Piedmont Manufacturing Company, Piedmont, S. C. The buildings will be one story in height, one to serve Mills Nos. 1, 2 and 4, and the other to feed into Mill No. 3. J. E. Sirrine & Company are the engineers.

The building for dyeing, bleaching and warehouse purposes at the Appleton Manufacturing Company, Anderson, S. C., has been completed and is being occupied.

A new opening room is being built by the Mills Mill, Greenville, S. C.

New opening equipment, new humidifier equipment and other improvements are being installed at the No. 4 plant of the New England Southern Mills, Pelzer, S. C.

The Aiken Mills, Bath, S. C., have let contract for furnishing and installing an electrical system for the entire mill village and for a distributing system and transformer for 206 houses.

It is understood that the Fort Mill Manufacturing Company, Fort Mill, S. C., will probably erect a bleachery at that place.

Kenneth Cotton Mills, Walhalla, S. C., have let contract for Universal winders for winding rayon for weaving purposes.

The manufacture of cotton and rayon bedspreads and other fancies has begun at the Vogue Mills, Gaffney, S. C. Wilson and Bradbury, New York City, are handling the output.

Calhoun Mills, Calhoun Falls, S. C., are remodeling and enlarging a number of cottages in the mill village.

Contracts for the building and equipment in connection with the new power plant of the Cannon Manufacturing Company, Kannapolis, N. C., have been awarded. The plant will have three 620 hp. Walsh and Weidner boilers, equipped with the Murray water wall furnaces, and will have a maximum capacity of 181,800 pounds of steam per hour. A 2,500-kw. General Electric back pressure type turbine will act as a pressure reducing valve, and furnish part of the power to the mills. The plant will be in operation in November, it is stated. Thomas E. Murray, Inc., 55 Duane St., New York City, are the engineers.

A $50,000 building program for the Leaksville mills was recently announced by the Carolina Cotton and Woolen Mills Co., Spray, N. C. Twenty houses in the village; a brick addition of 60x75 feet to the dyehouse; another of 50 x 125 feet to the slasher room, and other work is included in the program.

Contract for the extension to the weave shed at the Gibson Manufacturing Co., Concord, N. C., has been awarded. The extension will be 65 x 77 feet, three stories, of brick and wood construction, and will be used as a warper and slasher building.

A contract has been awarded by the Proximity Manufacturing Company, Greensboro, N. C., for changes and improvements to cost approximately $45,000. J. E. Sirrine & Company are the engineers.

The work of enlarging and remodeling the Cliffside Mills, Cliffside, N. C., is going forward. Five hundred terry towel looms, as well as a finishing plant and bleachery are included in the program. The plans for the proposed bleachery indicate it to be 200x60 feet, two stories, and 243x50 feet, three stories, are the dimensions of the finishing plant. Both buildings will be of brick construction.

Lola Gingham Mills, Inc., Stanley, N. C., have been purchased by J. F. Anderson, of Jersey City, N. J., at a reported price of $120,000. The mill is equipped with 352 gingham looms.

Stuart Mills, Charlotte, N. C., have purchased additional silk winding equipment from the Sipp Machine Company, Paterson, N. J.

Contract for the erection of a 10,000-spindle mill has been let by the Unity Spinning Mills, LaGrange, Ga.

The new plant to be erected at Thomaston, Ga., by the Hightower interests will be known as Martha Mills, in honor of Mrs. R. E. Hightower, Sr. Contract for erection has been let. The unit will be of brick and cement, and will contain approximately 280,000 square feet of floor space.

A cloth room 61 x 21 feet is being erected by the Social Circle Cotton Mills Co., Social Circle, Ga.

Arnco Blanket Mills is the name of the new plant to be built at Newnan, Ga. Cotton and cotton-and-wool blankets will be manufactured. The equipment will include 10,000 spindles and 160 looms. A. W. Arnall is president and R. D. Cole vice-president. Lockwood, Greene & Co., are the engineers.

An additional 10,000 spindles will be installed at the Eastman Cotton Mills, Eastman, Ga., which will double the capacity of the plant.

Contracts for the new mill to be erected at Nashville, Tenn., by Thomas Henry & Sons, Inc., of Philadelphia, have been let. Robert & Company, Inc., of Atlanta, are the engineers. A site of 15 acres in West Nashville has been acquired, and a building to house 20,000 spindles and 134 looms for manufacturing merino yarns and Turkish towels will be erected. The equipment will be removed

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Textile Processing

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Aqua Ammonia

Deal Direct with the Manufacturer

from Philadelphia.

Monticello Cotton Mills, Monticello, Ark., will build an addition which is to be one-story and basement, 126 by 138 feet, with a 48 x 53 foot extension, brick and mill type construction. Lockwood, Greene & Company are the engineers.

Construction work on the Bowie Cotton Mills, Bowie, Texas, is being pushed to completion, and operations will begin in July, it is stated. The mill will have 5,000 spindles and several broad looms on cord tire fabric.

Valley Cotton Mills, Harlingen, Texas, have been incorporated for $300.000, and will erect a mill. R. Roberts is president and L. H. Thompson secretary-treasurer.

Standard-Coosa-Thatcher Company, Chattanooga, Tenn., has let a contract to the Textile Finishing Machinery Company for a warp mercerizing machine and other equipment.

Itasca Cotton Manufacturing Co., Itasca, Texas, is constructing an extension to its opener room to take care of waste; also an addition to the slasher room.

The mill to be erected at Gadsden, Ala., by the Sauquoit Spinning Company of Alabama, Inc., will consist of four buildings, with a main mill, two story, 104 x 400 feet, and three two-story auxiliary buildings, 80 x 100 feet each. Contract has been awarded for the erection.

The New England Mill Situation.

The bad spots in the New England mill situation have come pretty well to the surface and are now so well known and understood that they are causing less apprehension among experienced manufacturers and financiers. The Hamilton Mills of Lowell, where a distortion of inventories led to a crash, have gone into the hands of receivers, it having been found impossible to reorganize them through the aid of old stockholders.

Losses sustained in operation by many other large mills whose financial management is centered in Boston are being lessened by the refusal of bank credit where assurances are not given that further undue risks will not be assumed until there is some chance of a restoration of profit margin in the business for which the mills are equipped. Some of the Western Massachusetts mills that have been idle or have been run at a loss, are to be liquidated. A proposition to liquidate the Lawrence Mfg. Co., of Lowell, a large knit goods plant, is now before the stockholders. Permission has been given by the courts to sell the property of the B. B. & R. Knight Company of Rhode Island for the benefit of the bondholders.

Propositions to purchase the Seaconnet Mills and remove them from the hands of trustees at Fall River are under consideration. A controlling interest in the Pocasset Mills at Fall River has passed into the hands of new stockholders. The treasurers of the Weetamoe and Chace Mills at Fall River have resigned and new appointees are to take hold shortly. The Conanicut Mills of Fall River are in the hands of the courts and will probably be sold.

Fully 40 per cent of the equipment in Massachusetts mills is idle due to curtailment of production forced by poor business and the unwillingness to manufacture save on order.

The mills that have weathered the long hard drop from 37 cent to 18 cent cotton in the past few years are now believed to be on a foundation from which it is possible to rebuild shattered fortunes by the application of good business methods, notably in the merchandising field. Investors have suffered great losses and such a thing as popular reinvestment appears to be far off. Nevertheless, events of the past two months, North and South, and in the markets in New York, have disclosed a degree of confidence in the future of cotton mills that was quite unexpected in many circles where cotton mill owners and managers have been accused of about everything that may be laid on the doorstep of unwilling parents.

Recuperation is going to be slow and hard but the best judges in this section are of the opinion that New England manufacturing has passed through its worst days. At one of several meetings where northern and southern managers of cotton mill properties have been getting together to face a common foe to the industry, and bring about a greater degree of cooperation between business men having common interests, it was said by some southern manufacturers that New England is not going to be wiped out by cotton mill investments in the South. This has been a well settled conviction in the minds of some leaders of the New England business, as well as large investors in southern properties for a long time, and the admission of it in a public place by competent southern mill men, has led to more open expressions on the part of financiers who have been working steadily toward reviving New England industries along new lines.

So far as these lines are defined they lead toward better and broader merchandising methods, a re-equipment of many plants to produce finer and fancier products, and a determination to readjust production to meet the conditions forced by short term buying and the carrying of lighter inventories by retailers, jobbers and converters. Changes as far reaching in their import as those mentioned are not likely to be of a spectacular character but they are surely underway.

New England manufacturers as a whole are not as well convinced as many southern men appear to be that the salvation of cotton manufacturing lies along the adoption of what are known as open price cooperative methods. Many of these methods have been undergoing trial for some years upon as favorable foundations as might be hoped for where men are closely allied in investment, managing plants in identical locations, and having many common problems to present to the advocates of the new system of competition for solution, if solution lay in the direction indicated.

There is a very strong cooperation being planned with southern manufacturers in the matter of organizing research work, the gathering of reliable statistics, the working out of better national plans for handling common cotton producing and selling questions, etc. But instinctively, there is as much aversion in New England toward carrying all troubles to government for solution as there is known to be among many of the wiser men in the South. At the same time, there is so much to be hoped for from a closer understanding among leaders in the two sections, and from a breaking down of the sectionalism that exists among those who are new to the industry and are not familiar with its growth and backing in the South, that anything savoring of attempts to prevent the broadest cooperation is being frowned upon by those who intend to take advantage at this time of the unusual opportunity for getting together.

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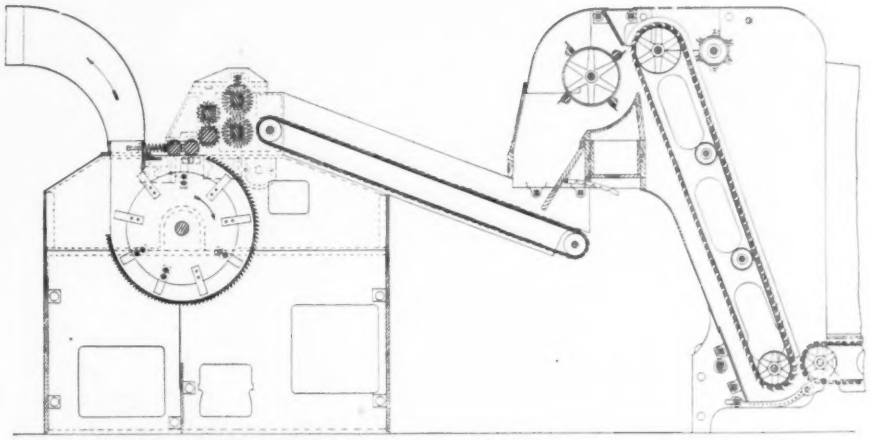
LARGEST MANUFACTURERS OF TEXTILE MACHINERY IN AMERICA



SACO-LOWELL LATTICE OPENER AND CLEANER WITH FEEDER

LATTICE OPENER AND CLEANER

Removes, by means of the large grid surface, *the heavy dirt and leaf* imbedded in the cotton, which is well opened by the action of the Buckley Cylinder and Feed Rolls.

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Cylinder entirely surrounded by grids, except for inlet and outlet.
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Canadian Representative:
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285 Beaver Hall Hill
Montreal, Canada

It is no secret here that resentment is expressed concerning the broadcasting of trade troubles to the world, and a recent utterance to the same effect by the head of one of the large commission houses handling southern goods in New York, has awakened a very hearty response in influential centers. The infliction of constant unsought advice through the trade newspapers is being especially condemned and it is likely that less of this sort of destructive criticism is going to be tolerated in the future.

The immediate question of curtailing production to bring buyers to an earlier realization that mills cannot be expected to produce and carry stock at a loss is being answered by a decidedly extensive contraction of output, which, it is believed, will soon bring about a healthier condition on which mills may regain a legitimate profit basis.

The prospects for the new cotton crop now seem good, and while lower prices are expected in some places, there are men who think that cotton at 18 cents is not overpriced in relation to other commodities, providing of course that general business is not to undergo a decline in the Fall. Print cloths, some sheetings, and a varied volume of highly styled rayon and printed goods, are believed to be stocked in excess of immediate consuming requirements. At the same time there are already evidences appearing to show that both converters and jobbers are carrying stocks detrimental to good business progress, and once confidence in the raw material spreads, it is thought that better buying will be seen.

Developments in the heavy goods end of the industry have been attracting close attention for the reason that the automobile industry has been held up to cotton manufacturers as the apotheosis of good business management and something that should be followed by the textile industry at once.

It appears that some men who have sold goods for auto manufacturing and tire purposes have been asked to defer deliveries and in some cases to cancel orders in hand. Production in the auto industry is running down, and there is grave hesitancy to use tried methods in reviving it. A stock of 20,000,000 tires in hand, valued roughly at $400,000,000, is considered to be so great that a ten per cent reduction cannot be risked to move it. At the same time, production is so evenly balanced that any curtailment will greatly enhance the cost of a limited output. Yet with all the statistics, regulated and controlled management at hand, etc., the auto industry has found it difficult to stem the normal effects of supply and demand.

There is much interest here in a restoration of old methods of granting jobbers a discount in the purchase of staple lines in order to assist in conserving the usefulness of the jobbing house form of distribution. The handlers of pepperell wide sheetings, and printed percales, have issued new prices on a lower level but with discounts extended so that the distributor is assured of support from the selling house, and a moderate degree of profit so long as the list is sustained.

This form of distribution is not welcomed by the few large jobbers who operate in the national field, but the small territorial jobber, who handles the great bulk of domestics distributed over the counters, find in it a greater promise than anything done in some years by the large selling agencies handling branded cottons.

Another development that is taking form slowly is the abandonment of the policy of selling finished goods so generally on width, weight, and construction, or what is termed on a mill price basis, rather than on the sounder mercantile basis of getting a fair price warranted by the kind and quality of merchandise offered. Instead of selling price, salesmen are being urged to sell merchandise.

The amount of time and investigation devoted to merchandising by manufacturing interests in New England is only faintly appreciated in the trade. Information has been gathered at individual and collective expense through selling agencies, jobbing houses, and via advertising agencies, textile schools, and colleges, and in other channels, for the purpose of disclosing just what must be done to meet the new conditions that confront manufacturers of all kinds. The knowledge obtained is already bringing about many striking changes in New York and Boston commission houses. While manufacturing is the thing now attracting most attention, the actual consumption and distribution of cotton goods is being studied intensively, and with good results thus far.

Cotton Comment.

BY H. AND B. BEER.

New Orleans, June 12th, 1926.

Since our last review the market has declined about $6 per bale, nearly all of the decline taking place during the past few days, due to the continuance of generally favorable crop weather, except in the South Atlantic States, especially in the Carolinas where moisture is urgently needed.

The crop got off to a bad start, especially in the western and central portions of the belt, particularly in Texas and the Mississippi Valley States, due to almost incessant rains and low temperatures at planting time, but the better weather of late; dry and warmer, permitted favorable progress of field work and growth, to such an extent that much of the lost time is being recovered.

Serving to confirm private advices as to the crop making better progress of late, returns to the Watkins Bureau, New York, average the condition of the crop at 75.5 vs. 71 two weeks ago, comparing with their report of 73.3 at corresponding time last year. Returns to this Bureau average the decrease in acreage at only 1.3 per cent less than last year's record area of 48,090,000 acres.

The government will not report on this year's acreage planted to cotton until July 2nd, when it will also make a report on the average condition of the growing crop, as of June 25th., as well as give the indicated season's production.

On July 2nd last year, returns to the government averaged the condition of the crop at 75.9, for which date the average condition for ten years is 73.5, which pointed to a yield of 14,339,000 bales, but the acreage was much larger than estimated at that time—48,090,000 vs. the preliminary estimate of 46,448,000, and the final ginnings, in bales of 500 pounds gross weight, was 16,086,000 bales exclusive of linters.

So far this season, or to June 1st, there has been a light emergence of weevil. According to returns to the government, at the 16 cooperating stations throughout the belt, only .82 per cent of the weevils put in cages had emerged prior to June 1st, while to the corresponding date last year 2.92 per cent of the weevils had emerged, which

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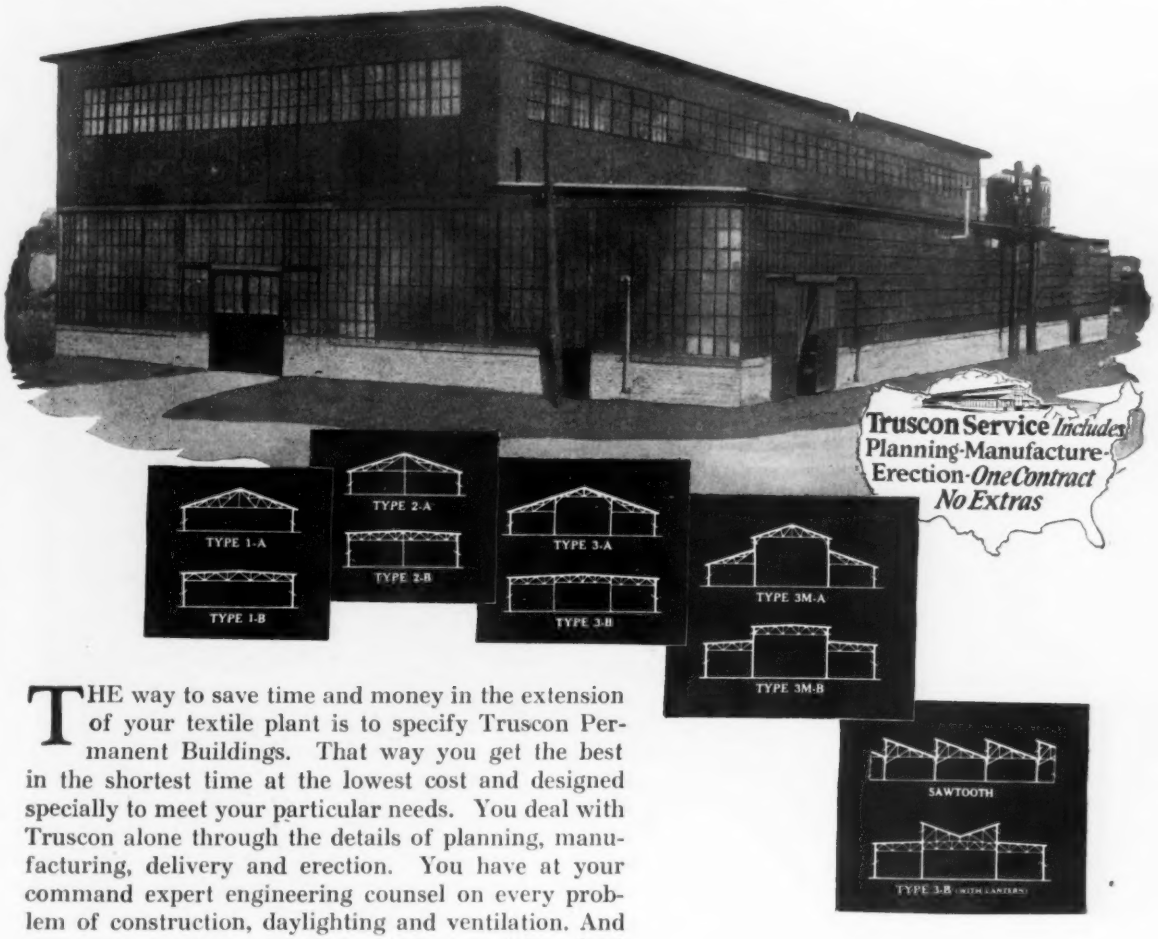

THE way to save time and money in the extension of your textile plant is to specify Truscon Permanent Buildings. That way you get the best in the shortest time at the lowest cost and designed specially to meet your particular needs. You deal with Truscon alone through the details of planning, manufacturing, delivery and erection. You have at your command expert engineering counsel on every problem of construction, daylighting and ventilation. And you get a permanent, fireproof Copper Alloy Steel Building at a cost far below any other permanent construction. It will pay you to come to Truscon.

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With your Truscon Building you can have a "Ferrodeck"---the most economical light-weight, non-burning roof construction. Truscon "Ferrodeck" is a built-up composition roofing, waterproofed insulated to any necessary degree on steel plates. For permanence, durability, economy, "Ferrodeck" cannot be equalled.

was 94 per cent of the total emergence last year.

The total average rainfall in Texas, October 1st to May 31st is 24.45 inches vs. only 10.33 inches to corresponding date last year and normal of 19.75 inches, which is a big asset to Texas this year.

Last year, it will be remembered, that one of the worst drouths on record prevailed in Texas to near the close of September, and, as a result of the shortage of rainfall the average yield per acre in that state was only 113 pounds vs. 138 pounds in 1924 and 174 pounds in 1920, years when there was an ample supply of moisture in Texas.

To understand that the potential crop possibilities in Texas this year are enormous, it is only necessary to refer to the following comparatives, especially when it is considered that private advices indicate only a slight decrease in the Texas acreage this year, perhaps not more than four per cent.

Texas— Year—	1926	1925	1924	1920
Acreage planted	(?)	19,139,000	17,706,000	12,265,000
Acreage picked	(?)	17,608,000	17,175,000	11,878,000
Rainfall Oct. 1 to May 31, inches	24.45	10.33	26.42	23.42
Average yield per acre, pounds	(?)	113	138	174
Crop, ginned	(?)	4,165,000	4,951,000	4,345,000

Last year, due mainly to the severe prolonged drouth, some 1,531,000 acres were abandoned in Texas, year before last 531,000 and in 1920 only 387,000. On the basis of an acreage in Texas this year of 18,374,000 acres, or four per cent less than last year, that state, if it makes 138 pounds per acre this year, or same as in 1924, would produce about 5,304,000 bales, and if it should equal the yield per acre of 1920, which was 174 pounds, the Texas crop could be as much as 6,688,000 bales.

Therefore there is the probability of Texas making up for any loss that many occur in other sections of the belt this year, and in that case another large crop, perhaps a bumper yield, would be the result. This feature of the situation has had much to do with the recent sharp decline in values, and is causing confidence to be lost as to the future providing a higher price for the staple unless very unfavorable weather is experienced during the remainder of the season, or unless weevil become numerous and destructive later in the year.

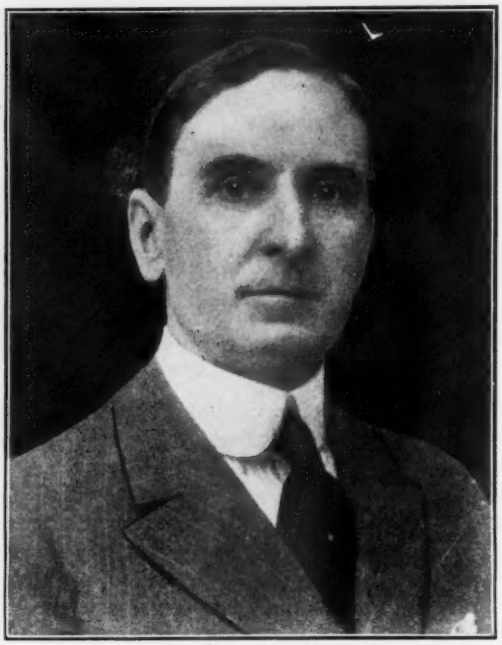
Irrespective of the possibilities of the growing crop, the following is the status of the present demand and supply situation of old crop cotton, which indicates a large world's carry-over of American cotton at the close of next July:

Bales—	This season	Last season
World's carry-over, August 1st	2,880,000	2,319,000
Crop, inc. linters, about	17,370,000	14,808,000
Season's supply, indicated	20,250,000	17,127,000
World's consumption, if	15,000,000	14,247,000
World's carry-over July 31, est.	5,250,000	2,880,000

Rogers W. Davis.

Rogers W. Davis, southern agent, Saco-Lowell Shops, Charlotte, North Carolina, died at St. Joseph's Hospital in Atlanta, Georgia, on Thursday evening, June 17th, following a brief illness, his death resulting from pneumonia. Mr. Davis had been in Atlanta two weeks' prior to his death, attending the commencement exercises of the Class of 1926 at the Georgia School of Technology, in which his son, Alexander, was graduated. Immediately after the exercises, Mr. Davis became ill and was forced to bed, the sickness which caused his death developing within a few days. Funeral services were held in the private chapel of H. M. Patterson & Sons, with interment at Crestlawn Mausoleum.

Mr. Davis was born near Covington, Georgia, and attended Emory College at Oxford, near Covington. He was graduated from the Georgia School of Technology in the Class of 1893, and became mechanical engineer with the George B. Sickles Company. After several years of successful service here, he became assistant superintendent of the Porterdale Mills of the Bibb Manufacturing Company, at Porterdale, Georgia. In 1900 he began work as salesman and engineer with the southern office of the Lowell Machine Shop, where he continued until 1911, when, with the closing of the southern office, he removed to Lowell, Massachusetts, as agent of the Kitson Machine Shop and selling agent for the Lowell Machine Shop. In 1912 he returned to Atlanta at the behest of these companies to



open a new southern office, but shortly therafter, these companies were consolidated with the Saco-Pettee Company, the new corporation being known as the Saco-Lowell Shops. Coincident with this consolidation, Mr. Davis removed to Charlotte, North Carolina, as southern agent of the new corporation, which position he held at the time of his death.

A host of friends mourn the passing of Mr. Davis. He was one of the best known and most popular men in the southern textile industry, and had contributed much to its upbuilding. He was past president of the Charlotte Rotary Club, and a former district governor of Rotary, to which he gave much untiring effort and work. He was a man of delightful charm and attractive personality, a business leader of integrity and of practical judgment.

Padre Textile Mfg. Co., Arcadia, Cal., will install equipment for making dress goods, leno or gauze fabrics, shirtings, etc.

An extension to be used as a superintendent's office and tying-in room is being erected by the Sherman Mfg. Co., Sherman, Texas.

H & B AMERICAN MACHINE COMPANY

BUILDERS OF

COTTON MACHINERY

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A MESSAGE TO MILL MEN

The question of replacements and repairs to your machinery is confronting you at all times; Rings, Spindles, Gears, Top Rolls and Fluted Rolls are all vital elements in cotton mill machinery upon which depends the quality and quantity of work produced. These hard-working parts of machines wear and should be replaced if production and quality is to be maintained.

This is an opportune time to have your machinery inspected and put in first-class condition.

We maintain at our works a Repair and Service Department which is at your disposal, where dependable service and quick deliveries are assured.

In ordering repairs from us, you have the advantage of receiving parts made from original patterns and machined with special tools on master fixtures, thus insuring exact duplicates.

We are prepared to furnish promptly:

Spinning Frame and Twister Spindles
Fluted Rolls - Top Rolls - Rings - Gears
Speeder Spindles and Flyers
Top Flats Reclothed Fluted Rolls Repaired

Your inquiries are respectfully solicited.

H. & B. AMERICAN MACHINE CO.

NOTES ABOUT MEN YOU KNOW OR KNOW ABOUT

JOHN F. LEHMAN has become overseer in charge of carding and spinning at the new Strowd-Holcombe Textile Mills, which are being placed in operation at Birmingham, Ala. Mr. Lehman is well known among the operating executives throughout Alabama and the South.

HIBBARD S. BUSBY has been elected director of The A. French Textile School of the Georgia School of Technology, Atlanta, Ga. He succeeds Clarence B. Seal, who resigned to accept a position with the United States Tariff Commission in Washington. Mr. Busby has been a member of the faculty of the University of Michigan, Ann Arbor, Michigan. He is a graduate of the Massachusetts Institute of Technology, and has taught in a number of universities. He has had several years experience in mills. He is an occasional contributor to the columns of COTTON on technical subjects. Mr. Busby will take up his duties with the opening of school in the Fall.

J. M. WILLIAMS has accepted the position of general superintendent of the Barrow County Cotton Mills, Winder and Lawrenceville, Ga., succeeding F. C. Graddick, resigned.

THOMAS NELSON, dean of the Textile Department of the North Carolina State College, Raleigh, N. C., has been awarded the honorary degree of Doctor of Science by that institution. Mr. Nelson has been connected with the textile school for the past 25 years. His degree was conferred in recognition of the distinguished service he has rendered the institution.

H. G. LEIGH, formerly superintendent of the County Moore Mills, Hemp, N. C., has accepted a similar position with the Globe Manufacturing Company, Gaffney, S. C.

PAUL HUGHES has become overseer of dyeing at the Pilot Mills of the Consolidated Textile Corporation, Raleigh, N. C.

E. G. MCIVER has resigned as manager of the Erwin Mills Company, Duke, N. C.

W. E. RAMBOW, formerly at the Winnsboro Mills, Winnsboro, S. C., is superintendent of the Southern Brighton Mills, Shannon, Ga. W. A. Hadaway, formerly with the Marlboro Mills, McColl, S. C., is overseer of carding. R. B. Hunt is overseer of spinning, coming from the Willingham Cotton Mills, Macon, Ga. J. F. Wright, formerly with the Marlboro Cotton Mills, McColl, S. C., is overseer of weaving and twisting. J. E. Moore is master mechanic. Dennison Hull, a graduate of the Georgia School of Technology, and formerly connected with the Anchor Duck Mills, Rome, Ga., is in charge of the testing laboratory. Mimms Harrison, formerly with the Anchor Duck Mills, Rome, and H. R. Melson, formerly at the Stark Mills, Hogansville, Ga., are also connected with the Shannon plant.

W. B. COLE has become president of the Hannah-Pickett Mills, Rockingham, N. C., succeeding the late R. L. Steele. Mr. Cole has been treasurer and general manager for a number of years.

J. R. OZBURN has become overseer of carding and spinning at the Acworth Mills, Acworth, Ga.

ROY H. ROUSE recently became general overseer of weaving at the Darlington Mfg. Co., Darlington, S. C. He was formerly night superintendent of the Manville-Jencks Company, High Shoals, N. C.

A. F. SMYRE has succeeded J. T. Knight as superintendent of the Yount Cotton Mills, Conover, N. C.

B. F. O'NEIL has been made overseer of carding at the Park Yarn Mills, Kings Mountain, N. C.

ROBERTS (BOB) TATLOCK, who has been connected with the Mill Devices Company, Inc., of Gastonia, in the repair department, has been transferred to the Providence office, 401 Union Trust Building, where he and Clifford E. Herrick, northern agent, will have charge of all shop and service work for the northern and eastern territory.

O. G. MOOREHEAD, formerly overseer of carding at the Henrietta (N. C.) Mills, has accepted a similar position with the Cliffside Mfg. Co., Cliffside, N. C.

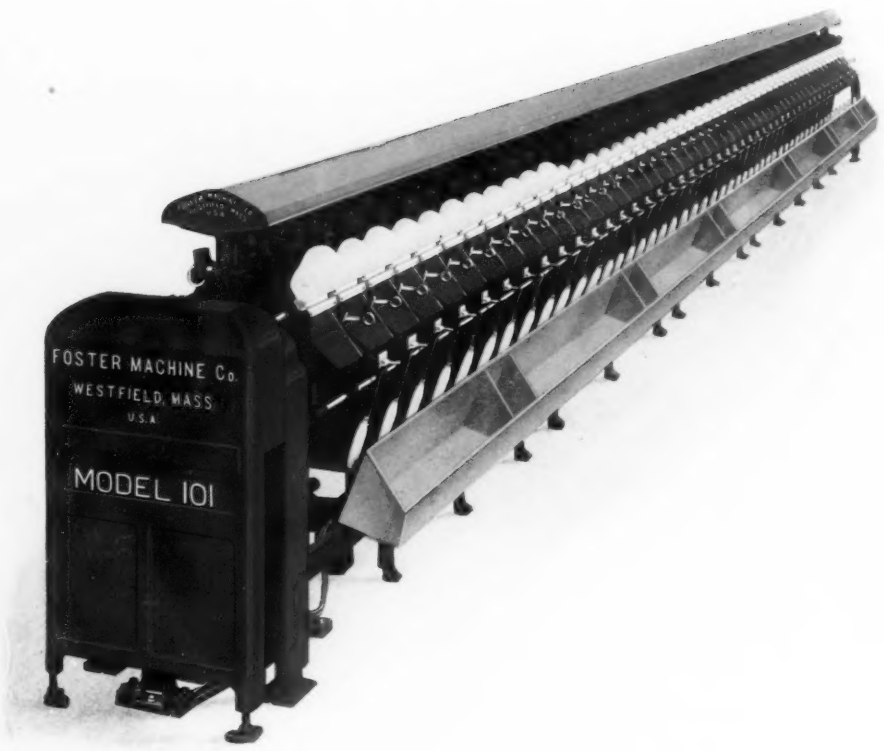
J. L. WOODWARD has succeeded D. Henderson as overseer of carding at the Fairmont Manufacturing Co., Fairmont, S. C. Mr. Woodward was formerly with the Victor-Monaghan Company plant at Greer, S. C.

E. A. BYRUM has become superintendent of the Robbins Knitting Co., High Point, N. C.

N. F. CANUPP has been promoted from overseer of weaving to the superintendency at the Phenix Mills, Kings Mountain, N. C.

EDWARD V. PETERS has been elected vice-president in charge of sales and also a director of the Tubize Artificial Silk Company of America. Mr. Peters has been for many years general sales manager of The New Jersey Zinc Company, and in this capacity has shown himself to be an outstanding figure as a sales executive and gained the confidence and esteem of those with whom he has come in contact. Mr. Peters took up his duties with the Tubize company on July 1st.

JAMES H. ASPINWALL, who for the past 16 years has been connected with the Willimantic plant of the American Thread Company, has been transferred to the company's plant at Holyoke, as overseer of twisting. A surprise farewell supper was tendered him by the superintendents, overseers and assistant overseers of the manufacturing departments with which he had been connected, and he was presented with a handsome leather traveling bag.



Model One Hundred and One

The Latest Design Foster Winder for Cones Tubes, Cheeses—(Cotton or Worsted)

We Invite Investigation of the Following Claims:

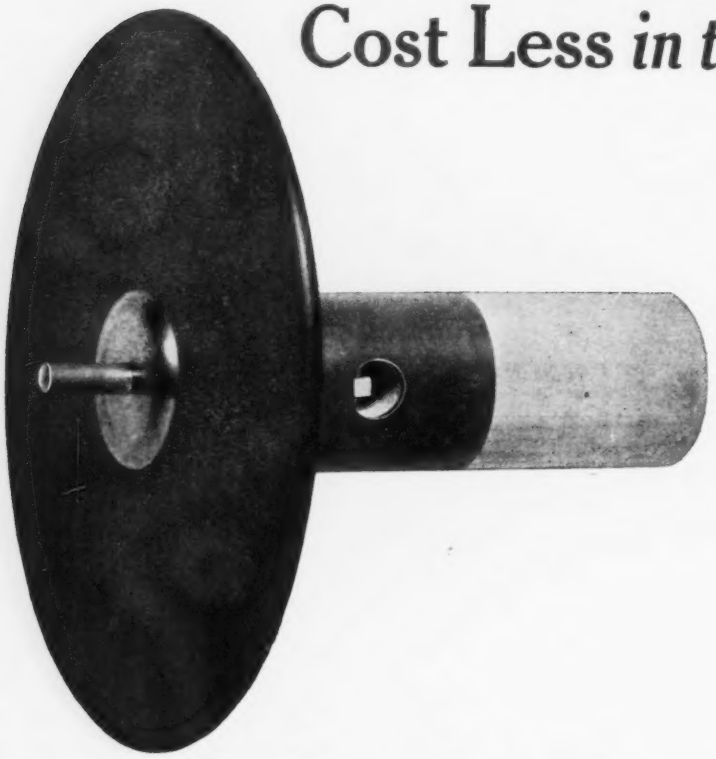
The greatest winding speed ever developed. The greatest production per spindle, per operative, per foot of floor space and per dollar invested. The Foster Knitting Cone produced on the Model 101 has the same wind, taper and density as the long time standard Model 30 Cone.

FOSTER MACHINE COMPANY

Westfield, Mass.

Southern Representative: John Hill, Healey Bldg., Atlanta, Ga.

U S Fibre Head Jack Spools Cost Less *in the* Long Run



THE INITIAL COST OF U S Fibre Head Jack Spools is about double that of wooden spools, but years of service actually makes them cost less.

This longer life makes the U S Fibre Head Jack Spool a good investment, yet it is only one of the many advantages which feature this spool.

To cut costs this is the spool to use exclusively in your own mill, not as a shipping spool. It will stand up perfectly against cement floors, chafing against spooler drums, and all kinds of abuse.

Three U S Developed Features

ARMORED BARREL

A 4-inch Vulcanized Fibre Ferrule is fitted on the end of the barrel, flush with the surface. It forms a guard where the wear on a Jack Spool barrel is greatest, and in combination with its heads will actually outwear two or three barrels.

HEAD CAN'T TURN

A special shouldered washer is driven through the head into the end of the barrel. It is fitted with wing spurs that positively prevent the head from turning.

GUDGEONS EASILY TIGHTENED

Lock nuts on the end of the gudgeons are fitted with new-style cupped end cap screws that can be set up positively and permanently with a socket wrench. The simplest, strongest, and most satisfactory construction to use.

We will gladly send you a U S Fibre Head Jack Spool so that you can test it in comparison with the spool you are now using. Simply write our Providence Office or nearest representative.

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M. OUSLEY
12 E. Stone Ave.
Greenville, S. C.

For Pennsylvania, Maryland and New Jersey
DAN O'HARA
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U S Bobbin & Shuttle Co.

Providence, R. I.

Look for the U S Seal. It guarantees you quality.

AN OLD TIMER SAYS

In working with zest and giving his best,
Just for the pleasure of the giving,
In the hope of helping his brothers along,
"Old-Timer" finds the sunshine of living

"You know Jim, the average weave room has more stoppage from spooler kinks than it does from most any other one cause, and the bad part about the kink is, when it stops a loom it is harder for the weaver to find than a broken thread—and often an inexperienced weaver will start up a loom several times before he finds the kink. Our overseer of spooling really has a better system on spooler kinks and bad spooling in general than any system I have ever seen in all my experience."

"What is it Old Timer?"

"He has a book with a page for every spooler hand and each week he will select one spooler hand and creel a warper with her spools alone—then he will take a seat in front of that warper and watch those spools run off. If there are any kinks he can sure see them; if any lapped ends he catches that too, or any bad spooling of any kind. He of course has his spooler hand to come look at her bad work and he takes such steps as are necessary to have her get her bad work down to the minimum. But here is the secret of his system. None of the spooler hands have any way of knowing whose spools he will save out any day, therefore they *all* have to make good work *all* the time for fear of getting caught.

"Gosh! that slasher is walking about Jim."

"What do you mean 'walking about?'"

"Running fast of course—what's the idea?"

"Well, Old Timer, one of those size fellows came along a few months ago and told us that if we would speed up the slashers we would have less shedding in the weave room, and just come out in the weave room and I will prove it to you.

"I know you always told me not to run warping and slashing fast, but you know I have found that some other men have run slashers besides you and some of them have got pretty good ideas—"

"Wait a minute, Jim. I did not say you would not have less shedding after speeding up your slashers—in fact, it sounds perfectly reasonable that you would—but suppose we stop and try to reason it out, Jim.

"Sit down here, my feet are getting tired any way.

"When you were a boy, Jim, don't you remember when you went to the cupboard to get some cold bread between meals, that if the biscuits had been cooked very brown they would be as hard as a rock when they got cold, but if those biscuits had been taken out of the stove at just the moment they were 'done' then those cold biscuits would be nice and soft when they got cold? Isn't that a fact, Jim?"

"Sure, Old Timer, but what in the dickens has that got to do with running my slashers fast?"

"Simple enough, Jim. When that size man told you to speed up and you would have less shedding he was right, because speeding up your frames had the same effect as reducing the steam pressure with the result that your starch was not dried so hard (cooked) on the yarn. Then when the warp went to the weave room it had more moisture already in it which caused it to take up more moisture than a dry warp will and you therefore have less shedding."

"How's that, Old Timer? You say the more moisture a warp has in it the more moisture it will take up in the weaving?"

"Yes Jim, to a certain extent, of course.

"Let me explain it in this way.

"You drop your handkerchief in a pail of water and it will take it several minutes to become saturated and sink.

"Now take that handkerchief to a press and put 2000 pounds pressure on it to press every particle of water out of it you possibly can, then drop it in the bucket of water and it will immediately sink.

"In other words, damp cotton will take up moisture much faster than dry cotton.

"Now do you understand why you have less shedding after speeding up your slashers?"

"Yes, I guess that explains it. Darn good idea, isn't it."

"Wait a minute Jim; let's reason some more.

"Why not just reduce your steam pressure without speeding up?

"Don't you believe you will have more bad work, more broken ends, larger laps before the slasher man gets there to cut them off, more yarn on the beam before he gets his comb adjusted properly after doffing, in fact more of everything bad with high speed than with moderate speed?"

"Oh, the Devil! Old Timer. Call the dogs off! You always have some fool argument against everything I do."

"Not quite that bad Jim. I have already told you that your mill is in much better shape than it was the last time I was here, but before we leave the slashers, Jim, I do want to tell you one more little thing that I see your man doing."

A New Repair Heddle

One of the advantages of Flat Steel Heddles is the ease with which broken heddles can be replaced.

Here's the new No. 5 Flat Steel Repair Heddle. Notice the illustration. By merely separating the two parts of the hook it is possible to slide it right over the bar of the frame.

Once it snaps into place it is there for good. It can't slip off. In addition, the new design permits the use of tempered steel, even harder than the steel in the bar of the frame. The heddle can't wear thin at that point.

This new repair heddle is made for all sizes and types of Flat Steel Heddles. Make a list of the styles you are using. Order a supply of No. 5's and be ready for emergencies. In the meantime let us send you some samples of the new heddles. Write.

THE STEEL HEDDLE LINE

"Duplex" Loom Harness (complete with Frames and Heddles fully assembled).
Drop Wires (Nickel Plated, Copper Plated or Plain Finished).

Heddles — Harness Frames — Selvage Harness — Leno Doups—Jacquard Heddles—Lingoes—Improved Loom Reeds—Leno Reeds—Lease Reeds—Beamer Hecks—Combs.

STEEL HEDDLE MFG. CO., 21st and Allegheny Ave., Phila., Pa.

NEW ENGLAND OFFICE:
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FOREIGN OFFICES:
Huddersfield, Eng.
Shanghai, China

FLAT STEEL HEDDLES
AND UNIVERSAL FRAMES

"All right, Old Timer; tell me as much as you like, but I am not going to cut that speed back down until I think over it some more."

"When the ends begin to break on the warper beams as the beams are about empty you stop your slasher to doff the loom beam don't you? Well, after you take the loom beam off, if you will start the frame up and run all the yarn off of the warper beams, letting your immersion roll stay down so the yarn will be sized, you will have a ball of *sized* slasher waste instead of *soft* slasher waste, and sized waste brings a better price than soft."

"Thanks, Old Timer, that is a fact, and although it will not amount to a million dollars per year, we are looking for the *little* things, and that sure is a little one. See anything else?"

"No. Nothing in particular Jim, except I would put two pieces of gum paper about six or eight inches apart on each warp if I were you. Then I would require the 'tie-in' man to place his clamp between those tapes and not have 12 to 15 inches of good yarn wasted on every warp he ties."

"All right, Old Timer, that's a good suggestion and I will do it."

"Your loom beams are pretty old too, Jim. These looms have been running about twelve years and those beams have been tightened up many times by your slasher men, but they have not been trued up; therefore the heads are wobbly. Rig you up a bench, Jim, and put a good man to work trueing those heads up, and when you come to one you can't get true take it to the shop and have three slots cut across the beam and run iron rods from one head to the other, put nuts with lock washers on the rods and you have a new beam just like the loom builders are now putting out. Take a small paint brush and with some old black paint put the date on every beam you work on and you can tell when you get them all fixed.

"Trueing up the heads will make your selvages run better and save you much loom stoppage. Almost every old mill I go in, Jim, I notice the beams are in bad shape."

"Yes, I'll admit I hadn't realized how badly they did need working on, Old Timer."

"Jim, just remember this, warp preparation is one of the most important items toward good production that we have in a weaving mill, and strange to say that spooling, warping, slashing and tying-in are neglected more than any other departments. You see, Jim, the average overseer and superintendent thinks those are the *little* things.

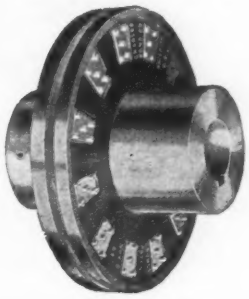
"I would like to stay in the slasher room longer, but it is almost stopping time, so we will have to hurry on.

[Editor's Note.—A continuation of Old Timer's trip through Jim's mill will be found in August COTTON.]

Catalog M, superseding all previous catalogs, supplements and folders, has been issued by Century Brass Works, Inc., Belleville, Ill., manufacturers of sanitary drinking fountains, etc. The book completely covers this line of equipment, giving illustrations and full information regarding the various designs and applications.

Nashville Industrial Corporation, Old Hickory, Tenn., has issued General Equipment Catalog No. 24 which lists the various machinery and equipment available from this source.

For Direct Connecting Motors to Spinning and Twisting Frames



Over 100,000 in Use

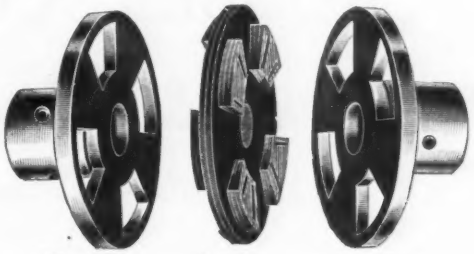
Grundy Couplings are designed to render the utmost in service on all direct drives. They are made according to specifications determined by an analysis of the textile industry. They are made in a variety of sizes, working on any direct drive—with fewer repairs and less attention than any other coupling on the market. Thousands of these couplings are at present in use in various Textile Mills throughout the country. Illustrated folder showing the "Grundy" actually driving Spinning and Twisting Frames will be forwarded upon request.

The following salient features could soon prove to you why

Grundy Patent Flexible Insulated Coupling

should harness your direct drives:

1. Takes care of uneven strains.
2. Self-adjustment insures perfect alignment of shafts.
3. Can be used whether insulation is required or not.
4. Perfectly balanced, and adapted for revolving at high speeds.
5. Runs in either direction; is close connected; easy of access; practically no repairs.
6. There are no projections to cause damage.
7. Maintains a positive and silent drive; free from objectionable hammer action features.



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HOW OTHER MEN MANAGE

Practical Discussions by Cotton's Readers On all varieties of Mill Subjects

We invite our readers to make use of this department for the discussion of any and all problems arising in the mill or the finishing plant. Questions, answers or letters need not conform to any particular style and will be properly edited before publishing. The editors do not hold themselves responsible for any statements of opinion or fact which may appear in this department unless so endorsed. This department is open to all.

Finishing 2.35-Yard Drill.

EDITOR COTTON:

I would like to find out through "How Other Men Manage" the practices of other men as to the best way to do starching on a 2.35-yard drill, 37 inches to finish 36 inches, to be 7 ounces to the yard. I use, for 60 gallons, 40 pounds of corn, 40 pounds 95 fluidity thin boiling starch, two pails of glucose, and one pail of oil. I get the weight all right, but it makes a mark when I run my finger over it.

I shall appreciate your getting me any information and suggestions you can secure from men who have had experience as to the best way to handle this material.

CONTRIBUTOR No. 4325.

Long Draft Spinning.

EDITOR COTTON:

There were probably no exhibits at the recent Boston Show that received more attention than those featuring various long-draft methods of spinning. Nearly every one who visited the show spent some time watching the exhibition frames, and I understand that a number of orders have been placed for this equipment.

Long-draft spinning has been tried for a long time, and opinion is divided as to its value. Four years ago, I talked with men who had seen it on the Continent, and they shook their heads and suggested that there must be a catch in it somewhere, as the thing looked too good to be true. Now that someone has had the courage to bring the idea to this country and try it out, there will no doubt be a scramble among the different machinery makers to get on the band wagon.

There was a very good article in your April number on this subject, describing the detail of long-draft spinning, and as I saw very few southern men at the Boston Show, any information at all about this may be interesting, since so few had an opportunity to see the system in operation.

The whole question of the advisability of a long draft at the spinning frame hinges on the relative expense of drafting there and elsewhere. If the necessary drafting can be done cheaper elsewhere, there is no argument in favor of doing it on the spinning frame.

As an experimental proposition, I have seen 150s spun from 5.00 hank roving on a French worsted frame. Since the roving was made for coarse work, it did not contain the grade of uniform roving as should have been used for this work, yet it spun remarkably well, and showed that a draft of 30 was by no means an impossibilty.

The catch in this lay in the fact that a French worsted frame costs about three and one half times as much per spindle as a cotton frame, and is a lot more trouble and expense from a maintenance standpoint. It would be cheaper to prepare the roving in the old way than bear the expense of such an expensive frame.

Four-roll cotton frames for long-drafting have been in use for some time, and seem to have been only moderately successful. It seems to be a difficult matter to get this excessive draft with rolls alone. The bite of the rolls frees the fibers almost instantly after they pass the nipping point, and with a draft of 25 to 30, the elongation of the roving is so great that there is a tendency to sloughing and bunching. If not enough twist is put in, the roving pulls in half, and with too much it gets bunchy.

The frame that seems to have attracted the most attention is operated with endless belts passing over the rolls and gradually releasing the fibers as the drafting takes place. Referring to the illustrations in COTTON it will be seen that these belts, or cots, hang on to the roving with a slight pressure until the front roll has taken it in.

This gives a very even drafting, and allows roving with little twist to be run successfully. A striking feature of this method is that it will run as well, or even better on single than on double roving. Naturally, on fine work, these two features are of great interest. If single roving can be used instead of double, and if very little twist will suffice, great economies can be effected.

That this is the case is proved in one mill, where, as well as I can recall, a speeder that formerly fed three spinning frames on 60s yarn, now feeds 20. They were using about 2.50 hank single, as against about 12.00 hank double. I have tested several samples of yarn made on this system with both single and double roving, and the single seemed to run slightly stronger, though there was more variation in the break on the different samples tested, and the yarn made from single roving varied somewhat more from nominal size than that made from double. The difference was very slight however, and it was certainly not enough to warrant using double roving, except perhaps, on very fussy goods.

Since this type of spinning costs very little more to install than the ordinary short-draft frame it is an attractive financial proposition. The costliness and complication of the French Worsted or Spun Silk frames, which are multiple roll type, would bar them from serious consideration on cotton, but the endless belt system is so simple and cheap that it seems to make drafting at the spinning frames instead of the speeders an economical proposition.

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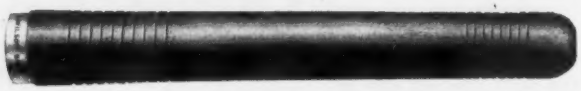

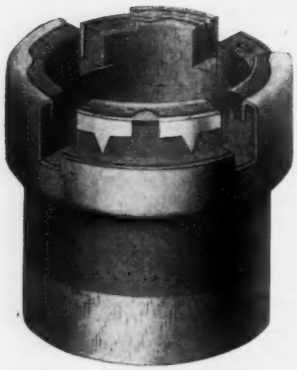

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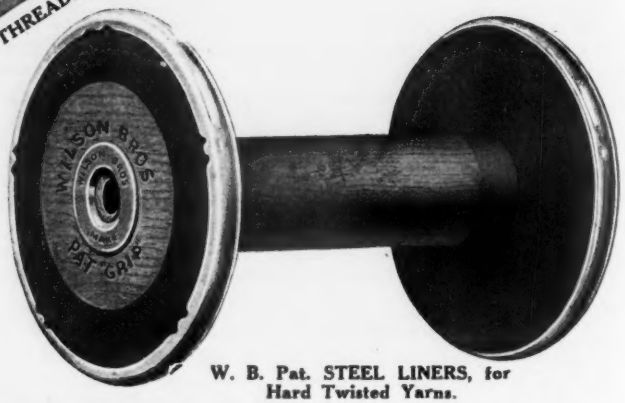

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Another valuable point in favor of this system is that mixed staple means nothing to it. You can take a mix of anything that happens to be lying around the place, and run it just as well as you can uniform staple. A test made on brokers' samples, containing everything from 7/8-inch to 1¾-inch staple, showed no difficulty whatever.

The basic principle involved in this method of drafting between endless cots would seem to be somewhat kin to that of the carriage draft on a mule. The analogy is not close, but there seems to be some connection. On the mule, the roll draft feeds the roving to the spindle only during a portion of the travel of the carriage. The distance from the point in the travel of the carriage where the rolls are stopped, and the end of the carriage travel gives the carriage draft, and this is the secret of the uniformity of mule-spun yarn. While the carriage is receding from the rolls, the spindles put just about enough twist in the yarn to hold it together at the point where the individual fibers will still slide over each other under a pull, rather than break, as will be the case when the yarn is fully twisted. The carriage draft stretches the yarn, and pulls it out at the same time that twist is being added.

The result is that the yarn automatically drafts and evens itself. On a ring frame, the twist is put in the instant the roving is fed through the bite of the front rolls, and if the roving is uneven at this time, the yarn will be uneven. With the mule, the carriage draft will largely correct uneven places in the roving automatically. In drafting while twisting, the smallest points in the yarn will take up the twist soonest, and in taking up the twist they become stronger, and pull out the more bulky portions, which will in turn assume the twist more rapidly as they diminish in size. In this way, the yarn very largely evens itself.

In the endless belt drafting, there is likely an approximate reversal of this process. In making the roving, the thin places will naturally tend to take more twist than the thick ones, and perhaps in drafting out through the slight pressure of the moving cots, the thick places draft more than the thin ones, and thus tend to even up the work.

Any of your readers familiar with worsted and silk spinning will recognize the principle involved in the use of these endless cots. In the Bradford Worsted system, where wools four to eight inches are run, the bottom roll on the spinning frame is about five inches in diameter, and the top roll from four and a half to five and a half inches. Naturally, these large rolls will not have as sharp a bite as smaller ones. In silk spinning, rubber covered rolls are used, the rolls being about two inches in diameter. The rubber roll, heavily weighted, covers a considerable area of the lower front roll, and approximates the action of the moving cots.

The field for long-draft spinning would seem to be in mills making about 25s or finer, except that mills on 12s to 25s using double roving could be included.

I understand that a number of southern mills have placed orders for this type of spinning equipment, and it seems to me the manufacturers will certainly have representative exhibits at Greenville this fall, but in the meantime even this slight information may be of interest.

P. O. H. (MASS.)

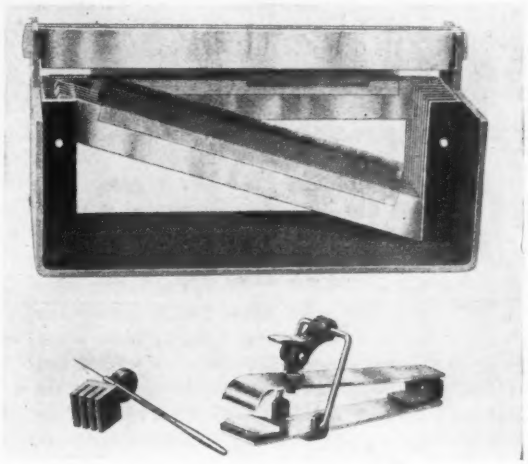
This is your department. Use it.

Cotton Stapling Machine.

EDITOR COTTON:

The cotton stapling machine is an inexpensive little device with which one can find out several interesting facts about cotton going into the work. While a certain degree of skill is necessary in using this machine, it is not difficult to acquire this skill, and the results are well worth the trouble.

The machine itself is a series of very fine tooth combs that hold the tuft of cotton to be examined. Accessories necessary to its use are: (1) A small wooden rake, to be used in pressing the fibers into the combs; (2) Tweezers, to use in picking up the fibers at their ends; (3) A board covered with velvet, to hold the fibers in place when put thereon; (4) A needle, with which to press the fibers into the pile of the velvet: and (5) A graduated glass, with



Cotton Stapling Machine With Accessories.

which to measure off the fibers of different lengths. All of these accessories are furnished with the stapling machine.

"Of what use would the stapling machine be to me?" may be asked. "Why do I need a stapling machine, when I can staple my cotton, by hand, in the good old fashioned way?" Well, the machine will tell some things about cotton that hand stapling does not show. A skillful stapler knows something of the character of the cotton after he pulls apart his sample and feels the "drag" of the fibers. He knows more about the character of the cotton by the feel of the body of the fibers. He can then pull the cotton and tell the commercial staple of the sample. But all this does not show him what percentage of short and long fibers there are in the cotton. With the stapling machine, one can measure the exact length of the longest and the shortest fibers, and can calculate the percentage of fibers of different lengths in the sample. With this information the spinner can tell definitely what roll settings are needed to give the greatest strength, and yet not cause cockled yarn. He can also tell about what percentage of fibers will go to waste. There are other uses to which the machine may be put, as will be shown.

It is not intended to assert that the stapling machine operator can do the work, or take the place of the cotton stapler. This machine can not be operated fast enough to

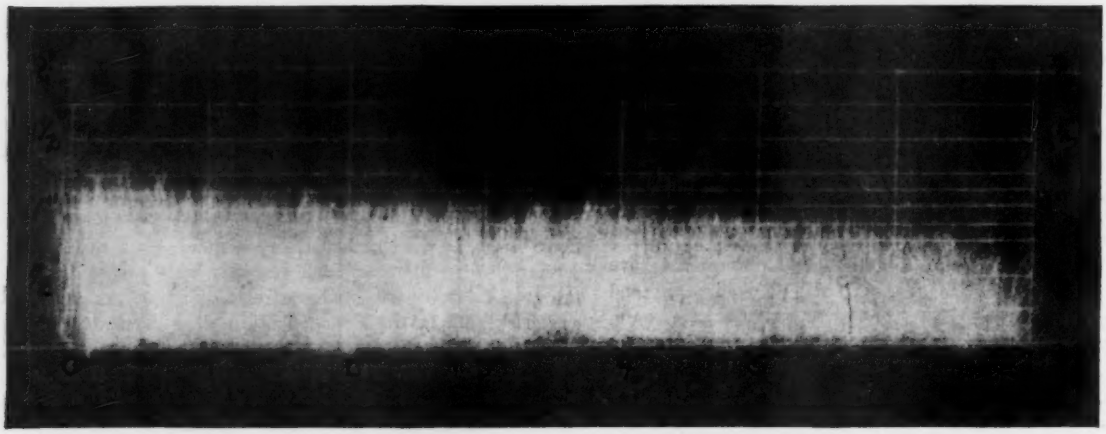
Cotton Fibers Picked Out of Two Pieces of Cloth and Compared By the Use of the Stapling Machine.

make it practical for stapling large lots of cotton. Its usefulness is rather that of supplementing the work of the stapler.

In using the stapling machine a sample of cotton is gripped at one end with the right hand, and at the other with the left, and is then pulled apart, just as in stapling. A small tuft of cotton is then pulled from the place where the sample was broken apart. This tuft is stretched and doubled back and forth between the right hand and the left, until the fibers are fairly parallel. None of the fibers of this tuft are thrown away, for it is desired to find what portion of these are long fibers, and what portion short.

When the fibers are parallelled the tuft is placed in the bottom combs of the machine, with the short fibers to the rear, or away from the operator, and pressed down with the rake. The top combs are then slipped down over the tuft and the cotton is thus firmly gripped and ready to be pulled. The ends of the fibers are gripped with the tweezers and pulled from the tuft. These are the longest fibers in the tuft. They are placed along a straight line, marked with chalk, on the velvet covered board, and pressed into the pile with the needle. These fibers being disposed of, the next fibers, which are slightly shorter, are gripped with the tweezers, pulled out, and placed by the side, and to the right, of the fibers pulled last. As this operation is repeated the line of fibers being formed on the velvet board gradually becomes shorter until the last fibers of the tuft are pulled. A line of fibers has now been formed, beginning with the longest and sloping down to the shortest in the tuft. These form a triangle with the chalk line as its base. The line should be about six inches long.

The measuring glass can now be placed over this line of fibers with the foot of its graduated marks on the chalked base line of fibers, and the graduations on the glass will at once show the length of the fibers. If it is desired to find what percentage of these fibers are, say, below ¾ inch in length and what percentage above, we can slip the needle under the graduated glass, at the point where it shows the fibers should be divided to give the desired lengths, and push the fibers apart. Now we have two lots



United States Government 1-Inch Staple as Pulled With the Stapling Machine.

of fibers, one longer than ¾ inch and the other shorter than ¾ inch. By weighing these two lots of fibers it is a simple matter to calculate the percentage of each lot, or length.

The stapling machine may be used to compare the cotton in one piece of cloth with that in another. Recently it was desired to compare two pieces of cloth, and it was necessary to know what staple cotton had been used in each. Some yarn was unravelled from each piece of the cloth. This was untwisted and the cotton removed. The cotton from each cloth was then spread out in different fiber lengths, with the stapling machine, and the two kinds of cotton were easily, and accurately, compared.

It is advisable to examine the waste blown into the dust chamber from the picker room occasionally. By taking a tuft of this waste and spreading it on the velvet board, with the stapling machine, it will be seen at once whether or not too much good fiber is being wasted. The card strips, and other waste products, may be examined from time to time, in like manner.

If it is desired to put on record facts concerning the staple length of any cotton, a tuft may be pulled and spread on the velvet board and a picture made for filing as a record. Or, after the cotton is spread on the board, it may be marked off in its different staple lengths, and the percentage of each calculated, and kept as a record.

Another use to which the machine may be put, is in sorting cotton by lots. It may be desired to run cotton bought as ⅞ inch to 1 inch in two different lots, one hank roving to be made from one, and a finer hank from the other. When the cotton is being received every tenth bale may be sampled and these samples set aside to be pulled with the stapling machine. Every experienced cotton man knows that all commercial ⅞ inch to 1 inch cotton does not run the same as to staple length. After the samples are pulled, and the fiber lengths calculated, it will be apparent which lot should be used for one, and which for the other, hank roving. The following table shows the percentage of fibers of different lengths for two lots of cotton as found by the stapling machine. Both lots were bought for ⅞ inch to 1 inch staple:

Bale	Mark	⅞" and over	⅞" to ¾"	¾" and under
1	JAX	55.3%	22.3%	22.4%
2	"	50.0	23.2	26.8
3	"	53.0	24.7	22.3
4	"	45.4	31.8	22.8
5	"	50.6	24.6	24.8
6	"	40.2	27.8	32.0
7	"	52.5	21.1	26.3
8	"	64.1	17.9	18.0
9	"	56.3	18.3	25.4
10	"	62.6	9.6	27.8
11	"	43.0	16.4	40.6
12	"	47.3	23.6	29.1
13	"	45.0	18.3	36.7
14	"	44.6	13.8	41.6
Average, 14 bales		50.7%	20.9%	28.4%
Bale	**Mark**	**⅞" and over**	**⅞" to ¾"**	**¾" and under**
1	KOO	34.2%	19.2%	46.6%
2	"	24.1	21.5	54.4
3	"	33.0	34.7	32.3
4	"	38.2	21.5	40.3
5	"	47.4	21.6	31.0
6	"	58.1	20.4	21.5
7	"	46.3	14.5	39.2
8	"	55.3	13.2	31.5
9	"	55.8	22.0	22.2
10	"	45.2	14.7	40.1
11	"	45.0	23.0	32.0
12	"	47.5	21.7	30.8
Average, 12 bales		**44.2%**	**20.7%**	**35.1%**

A recent issue of one of the textile magazines contained a report of a meeting of overseers of carding. In the discussion carried on at this meeting someone asked what percentage of fibers of different lengths a given staple cotton would show. To give some idea of how the percentage of fibers of different lengths run, the following tests were made with the stapling machine. The cotton pulled was the U. S. Government standard staple length, as marked:

% of fibers ⅞" or longer	% of fibers ⅞" down to ¾"	% of fibers under ¾" in length
U. S. GOVERNMENT ⅞" STAPLE.		
41.2%	16.7%	42.1%
37.0	19.3	43.7
43.4	18.9	37.7
44.5	17.6	37.9
41.5% Average	18.1%	40.4%
U. S. GOVERNMENT 15/16" STAPLE.		
56.5%	13.0%	30.5%
52.5	18.3	29.2
59.8	13.4	26.8
60.5	12.5	27.0
57.3% Average	14.3%	28.4%

These four tests, for each staple, were made from the same sample of cotton. The test shows what percentage of fibers of different length one should get to measure up to the Government staple length. It also gives an idea as to the variation to be expected when making different tests of the same lot of cotton. J. W. C. (TENN.)

Loose Ends.

EDITOR COTTON:

Loose ends in warps, caused from bad connections in electrical stop motions on warpers, often run through unnoticed in beaming. Soon the other end comes up and begins to pile behind the beamer's back. Then the beamer has to turn his beam back and tie up the end. This is illustrative of one kind of loose end. These are costly to the mill, but bear no significance when compared with the "loose ends" that are "running by" in many plants incessantly and unnoticed.

Not long ago the writer became engaged in a conversation with a superintendent concerning his dyeing processes. He happened to mention a particular color he was dyeing in raw stock. While all other colors in the plant were dyed in beam dyeing machines. I asked him why he did this. It happened that it was a vat color. The mill had changed their line of goods from high grade dress fabrics to light flannels and were then using this color, just because somebody was asleep. The color could have been dyed on the beam from direct colors with a great saving in time and cost. This is a "loose end" that is costly.

Once while the writer was employed in a slasher room, he noticed that every time a beam was brought from a certain warper it invariably ran out several yards longer than the other beams in the set. He began to be curious and inquired of the warper tender as to the trouble. By closely observing his counter on this machine, he found it failing to operate on the second digit dial, occasionally making the beam too long. Such "loose ends" as these, along with poorly arranged processes, inadequate machinery, faulty equipment and many others are running on unnoticed in many mills, where a tremendous saving could be derived, often from a simple correction.

Carders and spinners often fail to realize that when an improper setting is allowed to run this means poor running work in weaving and higher costs. The fibers have been drafted from 1-inch of sliver into hundreds of feet of yarn extending through whole spools of warp, or through many quills of filling.

Overseers are often forced to give constant attention to actual production, and seem to have little time to check faults. But they can, by keeping on the alert, catch many of these little things that are, after all, the greatest, for if

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After the pure molten Slag has been reclaimed from the modified pits by powerful electric shovels it is hauled over our own railways to these four modern plants.

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allowed to go on will continue to leak out dollars that might not only be saved but should be drawing additional profits if put properly to work.

We used to have the so called "mill doctors," or better termed, efficiency experts, come around and set the cards, make a few changes and then convince the president that he had a new mill, and leave the card grinder and overseer to be the victims for wearing out and breakage of parts on the cards. This is not the kind of saving that the conservative management of today would advocate.

Check your mill over and see if you are letting something pass daily that is as wasteful as some of the things mentioned. Don't stand by and let "loose ends" run. Go back to the source and stop them. R. A. Y. (N. C.)

Fitting Latches and Rockers.

EDITOR COTTON:

In my article published in the December issue of COTTON I disagreed with "Wash (R. I.)" in his statement concerning filing the latch square to the rocker.

My article was on the building of a perfect bobbin on the speeder, and in the March issue "Wash" comes back saying that he is from Missouri. His argument is, that

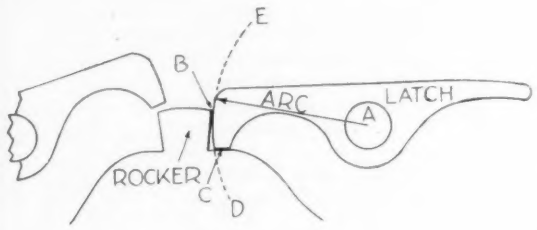

FIG 1

when the screw operates the latch to the changing point the space which occurs from filing the head of the latch to an arc, which is my method, gives too great a field in the meshing of the strike gear and twin gears. In the two sketches I will try to show "Wash" the reason why I believe that my method is correct.

In sketch, Fig. 1, I have drawn the latches as they would appear when filed to the arc. I have sketched the latch slightly apart from the rocker so that it would appear more plainly. It is understood that the latch would be touching the rocker at point *B*. I have drawn the arc *E-D* with another center, and as *A* is the axis for the latch it is necessary for point *C* to follow the line *E-D*. And as point *B* is also in the same line and is against the rocker, point *C* must also be against the rocker at the changing point *B*, so where is the space to give too great a field in the meshing of the strike gear and twin gears?

In sketch Fig. 2 I have pictured the latches filed straight to the rocker and also the arc with center at *A*. In this case also it is necessary for point *C* to follow the line of the arc *E-D* which cuts into the rocker at point *B*. Therefore the latch would have to be filed so that there would be no play between itself and the rocker when the latch was in. Of course at the changing point *B* the play would be taken up, but this would soon wear out the point of the latch, as that is the only part which does any work in this method of fitting. "Wash" stated that the idea of squaring the latch to the rocker was to hold the same

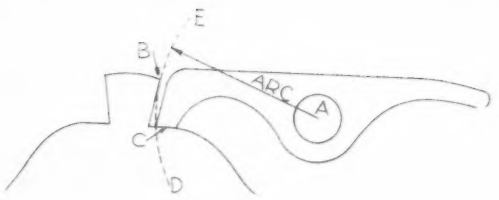

FIG. 2

amount of meshing between the strike gear and twin gear during the operation of the latch.

I should like to hear more from "Wash" on this subject. If I can be shown where I am wrong I will benefit by it, but in using my method I have not as yet encountered any trouble with a set of latches. W. O. R. (MASS.)

Excessive Breakage of Ends in Spinning.

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I read the question of "O. P. (N. C.)" who states he is having trouble with excessive end breakage, spinning 13s yarn. I note he is using a No. 7 and No. 8 traveler with No. 3 circle.

I believe he will find that his biggest trouble is in the traveler he is using, as I think it is too large. Also what he should do, in my opinion, is to cut the speed of the rail, for, by doing this he will be enabled to use a heavier traveler, and I would recommend a No. 2 circle square point No. 2 traveler.

He must remember, however, in slowing down the rail, he will have to increase the picks, because if he cuts the rail speed and doesn't make it take up more picks he will make a tangled bobbin. I believe he will find that the slower the rail is run, the less pull he will have on the traveler, and that the traveler will have more of a uniform pull on the ring.

By doing this I believe he will have 50 per cent less end breakage. The large circle traveler allows the yarn to whip at the bottom of the traverse and cause more balloon.

Using the No. 8-2 circle traveler, he also can get more yarn on the bobbin, but let me repeat that he must make it take up more picks in order to get the same taper on his bobbin. The rail on warp wind, such as he is using, should lay the yarn on the bobbin just like the speeder lays the roving on the bobbin; it should not pile up nor be too far apart.

"O. P." will find also that this method will make his yarn spool better by laying it more uniform on the bobbin. When it is wound spirally it has the effect of making the bobbin dance in the bobbin holder on the spoolers.

Another thing I might suggest is that if he has iron steps in the creels on the warpers, he should change these to porcelain steps. This will reduce the strain on the yarn and make better weaving. A. P. (GA.)

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Plant No. 1 at Ensley, Ala., where the famous "Ensley Basic Slag" is produced at the rate of 4,000 tons per day.

"Blast Furnace Basic Slag Headquarters for the South"

Four big plants

(two just completed) have a combined daily capacity of 6300 tons of scientifically prepared

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After the pure molten Slag has been reclaimed from the modified pits by powerful electric shovels it is hauled over our own railways to these four modern plants.

Here the slag is crushed, screened, and sized to meet standard specifications.

These four plants produce practically the South's entire output of pure Blast Furnace (Basic) Slag. They have a combined daily capacity of 6,300 tons—adequate for your demands no matter how heavy they may be.

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Birmingham Slag Co.

Slag Headquarters for the South

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THOMASVILLE

BIRMINGHAM

MONTGOMERY
OCALA, FLA.

allowed to go on will continue to leak out dollars that might not only be saved but should be drawing additional profits if put properly to work.

We used to have the so called "mill doctors," or better termed, efficiency experts, come around and set the cards, make a few changes and then convince the president that he had a new mill, and leave the card grinder and overseer to be the victims for wearing out and breakage of parts on the cards. This is not the kind of saving that the conservative management of today would advocate.

Check your mill over and see if you are letting something pass daily that is as wasteful as some of the things mentioned. Don't stand by and let "loose ends" run. Go back to the source and stop them. R. A. Y. (N. C.)

Fitting Latches and Rockers.

EDITOR COTTON:

In my article published in the December issue of COTTON I disagreed with "Wash (R. I.)" in his statement concerning filing the latch square to the rocker.

My article was on the building of a perfect bobbin on the speeder, and in the March issue "Wash" comes back saying that he is from Missouri. His argument is, that

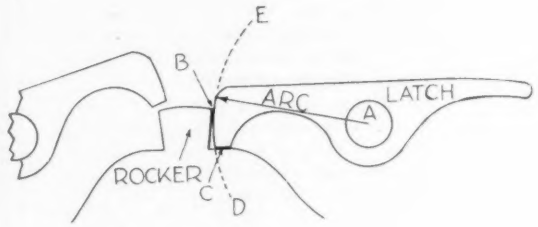
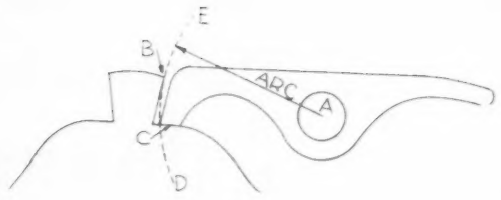


FIG 1

when the screw operates the latch to the changing point the space which occurs from filing the head of the latch to an arc, which is my method, gives too great a field in the meshing of the strike gear and twin gears. In the two sketches I will try to show "Wash" the reason why I believe that my method is correct.

In sketch, Fig. 1, I have drawn the latches as they would appear when filed to the arc. I have sketched the latch slightly apart from the rocker so that it would appear more plainly. It is understood that the latch would be touching the rocker at point *B*. I have drawn the arc *E-D* with another center, and as *A* is the axis for the latch it is necessary for point *C* to follow the line *E-D*. And as point *B* is also in the same line and is against the rocker, point *C* must also be against the rocker at the changing point *B*, so where is the space to give too great a field in the meshing of the strike gear and twin gears?

In sketch Fig. 2 I have pictured the latches filed straight to the rocker and also the arc with center at *A*. In this case also it is necessary for point *C* to follow the line of the arc *E-D* which cuts into the rocker at point *B*. Therefore the latch would have to be filed so that there would be no play between itself and the rocker when the latch was in. Of course at the changing point *B* the play would be taken up, but this would soon wear out the point of the latch, as that is the only part which does any work in this method of fitting. "Wash" stated that the idea of squaring the latch to the rocker was to hold the same



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Columbus an Example of Sound Industrial Growth

TWENTY-ONE EXPANSIONS by local plants which total nearly two million dollars and increase the output of these plants all the way from 33 1-3 to 100 per cent; eleven NEW ENTERPRISES, most of which have announced enlargements, and ground broken for a TWELFTH NEW INDUSTRY—a large clay working plant; at least TWO OTHER LOCAL VENTURES about ready for announcement; negotiations nearly completed for the outright removal of several sound manufacturing plants from other sections, and additional propositions which bring new capital and new men to our city are well under way.

As the result of these enlargements and new plants, the following new articles have been added to the manufactured products of Columbus: Industrial wheels for Fordson tractors, fine ceramics, concrete pipe, concrete roofing tile and several other new articles for the building trade, hollow wooden rolls for cotton goods, reels for narrow fabrics, kitchen tables, lawn benches and toasted peanuts.

This is the record for the last fourteen months in Columbus!

Columbus offers a solid setting for certain enterprises that are misfits in other localities, for Southern expansions of explorative character, and for the safe and profitable investment of new capital and new genius in lines of industry which are promised a great future in the South. Let us tell you about some of these.

Columbus is a city of marvelous progress and of progressive business men.
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Reliable native-born labor
No labor disputes or strikes
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Very low building costs
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Pure drinking water supply
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Five Years Tax Exemption

Not a Factory Failure for More than Sixty Years

New Industries Committee
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COLUMBUS, Georgia

for it.

While there are a great many more things about "O. P.'s" mill that I would like to know, I feel that he has stated his case very clearly indeed, and I venture to say that he will get some assistance from some of the readers of COTTON, whether he does from this letter or not.

To jump right in where the patient seems to be suffering the most, my first guess would be that he has some rings on the spinning that are pretty badly worn, and very likely he will either have to turn them or else buy new ones which would be better.

It may be that he has not adjusted his separators properly. They should not be too far back, nor too far forward. In either case the ends will whip down. With his 2-inch ring on a 3¼-gauge frame he should not be troubled seriously with whipping down, provided his rings are not too badly worn and the separators are properly adjusted. Of course he must keep the frames leveled and lined, and all spindles plumbed every year, but I imagine he has attended to this, since he has been worrying with this problem some time, it seems.

He states that he is making 13s yarn from 2.00 hank roving. This would give an actual draft of 6.5 instead of 7.5 as he states. I feel sure that he would get better results if he drafted less on the slubbers and more on the spinning. I would recommend a .56-hank slubber roving, and 1.70 speeder roving, which would give a draft of 7.6 on the spinning, which shouldn't be at all too long. It is barely possible that this change would unbalance him in the card room, but I would strongly urge making it if possible, and I feel sure that he can do so.

It goes without saying that you can't get satisfactory spinning unless the roving is made right in the card room, and there are so many things that might not be receiving the proper attention in "OP's" mill that it is hard to know just where to begin to enumerate them. If he does make his roving as well as it is possible for him to make it, then it will not matter so much if his spinning rings are worn a bit too much. In making his roving right he should mix the cotton carefully in the opening room, keeping just as many bales opened ahead as he has room to open. He should then keep his pickers in good shape, making sure that his eveners are kept well cleaned and oiled regularly all the way through each machine.

His cards must be kept sharp and well set, and careful attention paid to stripping, seeing that only one half the cards are stripped at any one time, skipping alternate cards each time. This is to prevent too much light work going through together. He should see that the end is allowed to run after stripping until the light stock is all through, and the sliver back to its approximate standard weight before it is put up.

Finished drawing should be creeled in sets, to prevent uneven work. All rolls in the card room should get more attention than they usually do, and should be of uniform diameter and kept well oiled. Calipers should be used to see that at least all rolls have both ends of the same diameter. In other words, if plenty of attention is paid to all the details that go to make more even, uniform roving, there is very little likelihood that he will have any trouble with No. 8 travelers, particularly if his rings are not too badly worn, and if he has his separators set right.

You will note I have not even mentioned the two items that have more to do with good running spinning than any other half-dozen things—getting the right grade and staple of cotton and keeping the humidity properly regulated. I assume that they have received the best attention that "O.P." can give them. Probably he doesn't have any say-so about the raw product.

CONTRIBUTOR NO. 4407.

EDITOR COTTON:

In answer to "O. P. (N. C.)" I am herewith submitting a long distance diagnosis on the spinning trouble which he is having. Though it may be too late, I am giving it for what it may be worth.

It will of course be realized that even a physician of great ability and with a great reputation as a diagnostician would be at a disadvantage where only a small part of the necessary information in the case were available and he would only be able to generalize. Not having any reputation at all in this particular line I am lacking in nerve to attempt more.

Seriously, there are quite a number of things which should be checked up in this case. The trouble is certainly not with the length of staple being used if it is one-inch staple. However, if the cotton is being properly opened, cleaned and prepared for the cards, it would greatly affect the spinning. The evenness of the finisher lap should be checked. If the cards are being made to do a very heavy production, or, if they are not set properly, or are in bad condition, the work would not run so well.

The machinery organization in a mill already in operation determines, of course, the weights, drafts and speeds, but there is considerable flexibility in this. If the machinery is in good condition very often better results are obtained by running the machinery at good speeds and as nearly as possible the proper drafts and weights than by running at lower speeds but with bad drafts and weights. In this case the drafts in the cards and on the slubbers could be improved if he has enough cards. The draft on the cards figures, allowing 5 per cent waste, about 87.00; it would be better to have this around 100 to 110. The correspondent would not want to draft over 6.00 on his drawing, but if he could come from his finisher with, say a 52 grain sliver drafting 4.06 for a .65 hank slubber roving, it would give better work on the slubbers and subsequently on the spinning, as less twist would be required. The piecing up should of course be checked all the way through from the lappers, as bad piecing causes slugs and uneven work.

The setting of the rolls should be checked carefully on the drawing, roving and the spinning frames. The speed and condition of the drawing rolls are, of course, very important, especially if metallic rolls are being used.

Coming to the spinning: The trouble may be back of the spinning altogether; on the other hand it may be partially or altogether in the spinning. We might mention several things which it would be wise to check here.

The condition and weighting of the rolls, and of course the settings; the condition of the rings, whether badly grooved or worn; the setting or plumbing of the spindles and the condition of the spindles and bolsters; the condition of the bobbins—they may be, that is, many of them, splintered or worn at the top, which would cause end breakage. If the diameter of the bobbin is too small it would be hard to get a traveler to run properly through a whole doff. This would hardly give trouble on 13s yarn

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with a 2-inch ring, using 1-inch staple, unless the bobbin be of unusually small diameter; the top rolls being in bad condition or too dry would cause lap-ups and end breakage; the side rails may be set so that there is too much or not enough distance between the top of the bobbin and the guide; if the spindle whirls are worn badly or the bands not kept at the proper tension, in case of band drive spindles, slack twist will result, which will cause bad running work.

It is, of course, necessary to find the right traveler and this can be done by experimenting, but, so far as the size of the ring, the traverse and the speed of the spinning is concerned the work should run well provided the frames are in good shape and the roving is right. No doubt the humidity conditions are watched closely. This naturally is important. I know of a mill with this same make spinning, band drive, 2-inch ring, Number 2 flange, 7½-inch traverse, using 1-inch staple, which has been making 13s warp yarn with standard twist for several years, at a front roll speed of from 165 to 170 r. p. m., and the gauge of these frames is only 3-inches. Everything behind the spinning must be right or this could not be done. We have seen the careless use of a "flap" around frames cause considerable harm on account of fly and slugs, but no doubt "O.P." does not tolerate such practices.

Beyond a doubt "O. P." is familiar with all the various points I have mentioned but I may have suggested something that has not had close attention, and this is about the best that can be hoped for under the circumstances.

G. N. (GA.)

EDITOR COTTON:

In reply to "O. P. (N. C.)" who is having trouble with too many ends down on his spinning I submit the following:

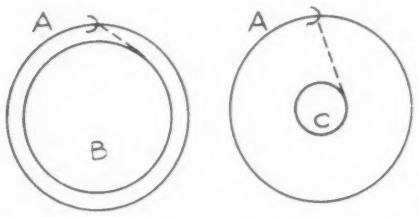
I have gone over the information given in his inquiry very carefully and decided that "O. P." is a very lucky yarn manufacturer, both as to machines and the cotton he is using. His draft organization is very good, and very few of us have the privilege of manufacturing 13s yarn from one inch cotton.

My opinion is that "the straw that breaks the camel's back" in this case is the 8317 r. p. m. of his spindles. I realize that 367 r. p. m. faster than standard doesn't sound like very much when one is talking in terms of thousands, but when a thing is loaded to the limit and a little more added, it is over-loaded. I suggest that he cut his spindle speed down to about 7800. I believe that with this spindle speed he will be able to put on a traveler which will keep the yarn from ballooning excessively when the bobbin is full and be able to start the frames up after doffing without an excessive number of ends coming down. It will be possible at the same time to take out one or two teeth of twist and still maintain his present breaking strength and at the same time speed up his front roll, thus making up to a great extent the front roll speed lost in cutting down his cylinder speed.

In referring to a table of standards it is well to remember that they are made up for ideal conditions. Most men in practice do not have ideal conditions to deal with. Some have poor equipment, others have bad humidity conditions, others low stock and nearly all have a "skeleton in the closet" which makes it necessary for them to determine their own standards. In a few cases where conditions are unusually good the machine builders' standards have been exceeded, but these are unusual. In determining a standard it is a good thing to remember the old saying, "If you get quality, quantity will take care of itself." Of course quantity production is very desirable, but in most cases it is best to make quality the major consideration. A high front roll and spindle speed looks very good on paper, but if they are producing bad work and lowering actual production they are very poor assets in practice.

I suggest to "O. P." that he not accept anyone's statement as final, but that he run a series of experiments on a few of his frames and determine a cylinder speed under the conditions in the mill he is working in to adopt as a standard for 13s yarn. He can do this by lagging a driven pulley on a counter shaft that affects a few of the frames. I would first select a pulley for this purpose and put one thickness of leather belting around it. If this didn't give the desired result I would add another thickness of belt, etc., until a desirable cylinder speed is determined. He can then lag all the pulleys in the pulley train driving the frames on 13s so that the speed will be the same as this standard, or better still, buy new pulleys of the correct diameter if he expects to run this number of yarn indefinitely. It will be necessary of course to change the travelers to suit the speed. If he has motor driven frames a larger driving gear or a smaller driving gear will give the same effect. He will have to determine his own method of conducting the experiment to fit the conditions in the mill where he is employed.

There is another remedy for this trouble which I haven't suggested because I didn't think it would be practical in this case, which might be of interest to someone. That is, to increase the size of the empty bobbin. This



would have practically the same effect as slowing down the cylinder. The whole trouble is the fact that he is unable to use a traveler light enough for the yarn to stand the tension of starting and running on an empty bobbin and at the same time heavy enough to prevent excessive ballooning when the bobbin is full. The only way to overcome the excess starting tension is to either slow down the cylinder as explained in the foregoing, or decrease this tension. I am going to illustrate the method of doing this with two simple sketches. *A* represents the ring in both cases; *B* and *C* represent full and empty bobbins respectively. The dotted lines represent the passage of the yarn from the traveler to the bobbin. It is evident that the nearer the dotted line approaches the center the more it will drag on the traveler and therefore the more tension on the yarn and the more likelihood of its breaking. The nearness of the approach of the line to the center is determined by the size of the empty bobbin. Therefore, if the size of the empty bobbin is increased it will decrease the starting tension on the yarn and make it possible to use a traveler heavy enough to prevent ballooning when the bobbin is full in the case under discussion.

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Reduce direct labor costs.

Eliminate your spool replacement expense.

Eliminate loss of yarn due to spools (in many mills this loss runs into thousands of dollars).

Eliminate all possibility of injury to employees from rough or slivered spools.

Increase about 10% the yardage on your spools.

Eliminate warper kinks and knots due to spools.

Eliminate broken ends on your warpers due to spools and thus increase warper production 20% to 30%.

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It might be of further interest to state here that the traveler when it is running around the ring has two forces acting on it. They are the pull of the yarn as it is wound on the bobbin and the tendency of the traveler to fly off the ring in a line tangent to it. The ideal condition exists when these two forces are so evenly balanced as to prevent excessive ballooning from one force and end breaks from the other. G. S. T. (GA.)

EDITOR COTTON:

I should think that the trouble with the work of "O. P. (N. C.)" is that his speed is too high, and he does not insert enough turns of twist per inch. I would suggest that he cut his speed at least 10 per cent, and put in about two turns per inch more twist in the yarn.

Another thing that does not particularly look good to me is that he has only two processes of picking. We have three processes, and a Murray cleaner. On the same numbers, with 7/8-inch staple cotton, we have besides the vertical opener, blowing system, and automatic feeders on the openers. Our weights and drafts are about the same as those given by "O. P." in his letter. I made a little calculation on the speeds, and roughly speaking, the front rolls make about 140 to 145 r.p.m., and the spindles about 7,950 r.p.m. If the other conditions in his spinning are in good shape, I don't see why he shouldn't come out very well.

His carding lay-out, with the possible exception of only two processes of picking, is good. I have tried only two processes on this coarse yarn, and single roving in the spinning, but I never could get the results I secured with three processes. While on 30s warp and 40s filling, with intermediate roving frames and double roving in the spinning, we get by with it all right. T. A. D. (GA.)

EDITOR COTTON:

In submitting his question with reference to difficulty in his spinning, "O. P. (N. C.)" gave the following lay-out for making 13s yarn:

Picker laps	12 ounce	
Card sliver	57 grains	87.8 draft (5% waste)
1st Drawing	60 grains	5.7 draft
2nd Drawing	60 grains	6.0 draft
Slubber	.68 hank	4.9 draft
Fine frames	2.00 hank	5.8 draft
Spinning	13s	6.5

Starting with the pickers, I note he states that he has only two processes of picking. I have been at a number of mills of which I have records; and among these is the lay-out of a mill making 14s yarn, and they have good running spinning. They used 7/8 to 1-inch cotton, and got good results. This mill ran three processes of picking, and I am of the opinion that this is best, even in coarser work, where the doublings are light due to no intermediate process of picking. However, if a breaker picker is used with an automatic evener device, two processes of picking do fairly well, but I still favor the three processes as I have run both ways on the same numbers of yarn and got the best results in good running spinning on three processes of picking.

I would suggest that "O. P." have a frame made that is exactly a yard long and 40 inches wide, and take a lap and roll it out on the floor and weigh sections of the lap on a scale that will weigh fractions of an ounce—the maximum variation from the lightest yard to the heaviest yard on, say, twelve tests in one-yard pieces in the lap, should not be over .75 to 1 ounce. Some laps may run even less than this and some slightly over this, but this is a good average to go by to ascertain if even picker laps are being made. I take this from exhaustive tests made in a number of mills, and this is what some of the best mills are doing.

The card sliver weight given by "O. P." is very good, and the draft is good. However, the amount of cotton that should be put through the card for good running spinning should not be over 550 pounds for 60 hours. The sliver should be allowed to run on the floor a bit before piecing up after stripping, which allows the card to fill up. Good cards and good carding are the foundation for good spinning. This is the secret where the English mills make finer yarns than we do from shorter staple cotton.

His drawing sliver is very good, but the factor of the speed of the front rolls is very vital in getting good spinning. I once was at a mill where 450 r.p.m. was run on drawing and they could hardly keep up. The speed was cut to 350 r.p.m., and actually more cotton was put through than at 450 r.p.m. I now run my drawing 250 r.p.m., and I seldom find a drawing frame stopped. "O. P." might take a slightly lighter drawing sliver—say 55 grains—and this will help the draft on the slubber, which is rather high. A draft of 3.50 to 4.50 is the range for slubbers.

Only enough twist should be put in the slubber roving so it will not break back on the next process. High spindle speed on the slubber and fly frames causes bad running spinning, in my estimation. I once took charge of a mill and cut the speed on all fly frames. Before, they could not keep up in the card room. By lowering this speed, I was able to take out two teeth of twist in the slubbers, two teeth of twist in the intermediates, and one to two teeth of twist in the fine frames. As a result, the card room did not have to run at all on Saturday. Also, the spinning ran much better. I have worked with superintendents who put twist in the roving when the spinning ran badly—I am of the opposite opinion. Just enough twist should be put in to prevent the ends from breaking back in the next process. Not long ago, I put in an extra tooth of twist on my fine frames, and the breaking strength of the yarn promptly dropped several pounds and the numbers were heavier.

I believe "O. P.'s" trouble is in his card room and not in the spinning room.

A few suggestions that "O. P." might try in his spinning, as his speeds, rings, etc., seem very good. Why not try raising the thread board on the spinning frame to see if this will help some? If "O. P." would try the filling wind with the use of the warp cam I am sure it would help him a whole lot. This gives a bobbin that gives uniform pull to the traveler all through the doff from start to finish. I tried the regular filling wind and could not get it to run at all well right after the doff. After changing to the filling wind with the warp cam this trouble was eliminated. I will not go into the theory of why this is so, but I do know it to be the case. W. J. R. (N. C.)

EDITOR COTTON:

This is in response to "O. P. (N. C.)" who states that he is having trouble with excessive end breakage in spinning. He advises that he has used a 2-inch ring for making 13s warp yarn with regular warp build. He did not give the size of his bobbin, and this has a great deal to do with

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the size of the ring, but in making my suggestions I will assume that he is using a 7/8-inch bobbin.

In the first place, in my own opinion, his rings are too large. A 2-inch ring is suitable for 6s and 8s yarn but is too large for 13s. Of course he can run a 2-inch ring on 13s but will have to cut his speed below standard to do it—and he indicates that he is now considerably above standard.

He further reports using two processes of picking, making a 12 ounce lap and a 57 grain card sliver. I fully believe that he would get better results if he would increase his laps to 13 ounces and his card sliver to 60 grains. The balance of his layout seems to be okeh, and he should have no trouble spinning 13s yarn, especially at 151 r. p. m. front roll on spinning, as Draper's standard is 168 r. p. m.

If "O. P." will decrease the size of his ring to 1 7/8-inches, No. 2 flange, or to 1-5/16-inches No. 1 flange—the latter preferred—and change from warp winding to filling winding, if his carding is properly done, he can easily put his front roll speed up to 168 or 170 r. p. m., and his spinning should run like a top.

He says he is having 50 per cent more end breaking than he should have, which of course is bad. He also says that if he puts on a traveler heavy enough to hold the ballooning down, when the frame gets nearly full it will pull the ends down after the frame is doffed. This argument alone should convince any man that filling wind is preferable to warp wind, as it is impossible to regulate a traveler on warp wind so that there will not be some part of the doff running badly. For instance, if he puts on a traveler light enough to make the spinning run good after a doff, it would be too light after it is full, and vice versa, as a traveler on an empty doff will cause excessive strain on the yarn.

With filling wind this would be eliminated, as it would have no extreme tension at the beginning or finish of a doff, as the tension would be very evenly divided throughout the filling of a doff. With this condition, as he has given it, there is one of two things for him to do—cut his speed down to where his spinning will run, or else put on a smaller ring.

This man is running a 2-inch ring on 13s, and I would be willing to bet a "gold mule" that he never runs any doff full, which would prove that he is not gaining anything by using a large ring, and merely thinks he is. In my opinion, one mistake our machinery builders have made in the past has been to put too large a ring on our spinning.

With the layout as he gave it in his letter, and with the proper size ring, this man should be able to run his front roller at a speed of 200 r.p.m., and make his work run good. I am running 22s yarn at the same speed which he is running 13s, and I also use 1-inch staple cotton.

"O. P." further states that he has experimented with different kinds of travelers and has been running some No. 7-2 circle travelers, square point. If he would change to round point travelers he would get better results. I have never been able to see any good in the square point traveler and would not have one in my mill. I believe that even a smaller traveler than a No. 2 would give him still better results, probably a No. 1-A circle. All manufacturers do not make a No. 1-A traveler, but a good many of them do.

I hope this opinion may be of some value to this and other readers of COTTON. CONTRIBUTOR No. 4402.

Cone Belts.

EDITOR COTTON:

I have read the article by "C. C. (N. J.)" in your May issue on the subject "The Care of Belts" and the thoughts brought out are valuable. Concentration or thought given to any item of expense that is of the same magnitude as belting costs around industrial plants soon makes the individual stand out prominently above his coworkers.

I would have been glad if "C. C." would have carried the thought of tension, flexibility and stretch further, enlarging on the thought of loss in machine output during the process of breaking in a new belt, that is putting it on reasonably tight at first and letting it get set to the work and stretch itself out for a week or so and then tightening it up and putting it to work. There is a lot of loss in machine output during the "weaning" or process of breaking in a belt.

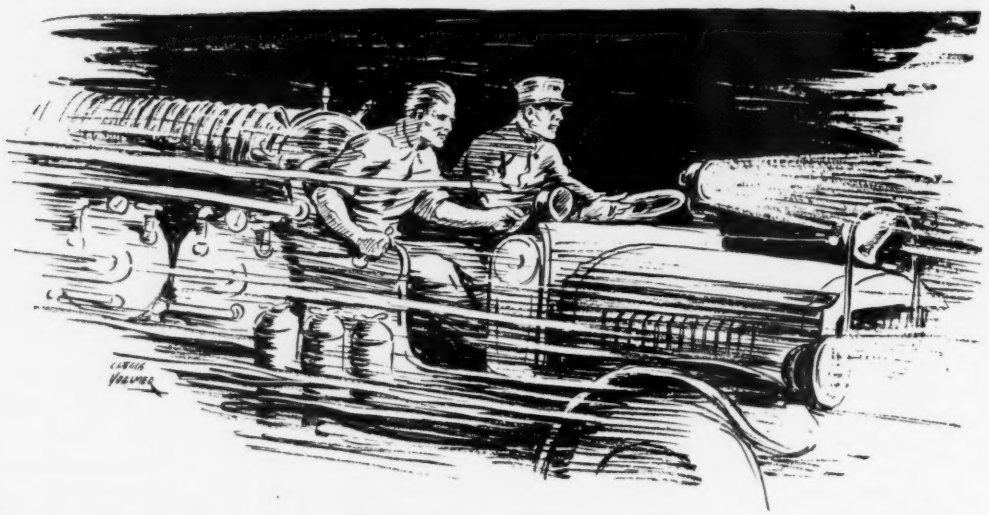
One of the larger industrial organizations make all their belting contracts carry one particularly important clause and that is that all belts purchased under their contract must be run on pulleys under a tension to remove part of the stretch and develop any defects, if any there be, and they figure that with their machine and attendant costs they can better afford to pay the belting manufacturer a premium than to stand the loss in under-production and loss in fuel or power consumption.

Another high spot in "C. C.'s" article touches on the very important matter of cone belts. I think he is wrong when he says, literally, we Americans can't make cone belts. We don't have to send abroad for them, because this thing about the grass being always greener on the other side of the fence is a mistake.

An American made cone belt covers the precise outline of "C. C.'s" line of thought, minimum stretch, pliability, an inner ply of soft leather having maximum adhesion and this adhesion supplemented by hollow rivets sunk below the surface that act as vacuum cups on the same principle as is used on automobile tires. The outer backing is made to withstand the rubbing action on the shipper and the inner ply is not cemented, why, because on the tapered cone one edge of the inner ply has to travel faster than the other and it either slips on that edge or the cement and stitching has to give way with a consequent shortened life.

The apparent ideal in a cone belt is one having the point of contact or fastening of the inner ply directly in the middle and not on the edges and by leaving this inner ply uncemented it can adapt itself on each side of the fastening, that is the load is taken exactly in the center of the inner ply and each edge is loose so the leather can give or adapt itself to the faster or slower surface speed of the cone or taper.

In the travel of a belt from one end of a cone to the other there develops irregular movements and speeds if the inner ply is cemented and stitched because at some points in its travel the instant of contact or perfect adhesion is liable to come on one edge where the diameter is larger or smaller and the other edge of the belt doing the slipping, then say a drop of oil hits the cone, the edge of the belt that is taking the load immediately slips and the other edge takes it up with just that differential in the speed as to the difference in the diameter of the cone at the two points. Where the inner ply is fastened in the center then either edge being loose or uncemented the leather gives and takes



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That's what you invariably think every time you enter that room where your drums and barrels of paint oils are kept. You could hardly say you are *trying* to have a fire—but you do know the inflammability and combustibility of oils, oil-soaked floors, rags, etc.

The best insurance against fire is prevention. The best prevention is the Bowser system of *safe storage*—steel, air-tight tanks.

Besides that, Bowser equipment saves 4% to 12% waste on oils—saves your men's time and the danger of accident and keeps the oils in better condition.

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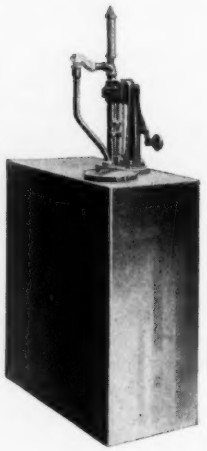

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and the speed is positive to almost that accuracy as if it were driven with a cord or string.

I should be glad to see more of these articles touching on the intimate things of plant operation. R. E. C. (Ga.)

Reducing the Doffing Cost in Spinning.

EDITOR COTTON:

The boss spinners and section men who have found the cost of doffing an element that seemed unproportionately high in bringing up the cost of spinning might be interested in knowing how Cliff Kinsler, boss spinner at the Issaqueena Mills, Central, S. C., has devised to reduce that cost.

"Cliff," as he is familiarly known by the mill force, is one of the most alert practical room overseers the writer has known. Beginning work in the mill at the age of ten years, and being denied the opportunity of a high school education, he has not shunned the duties nor evaded the opportunities for studying the mill business, and going forward. He is always on the lookout for methods to increase the efficiency of his room. He is an excellent student in the evening school for textiles, and is looking forward all the time.

Since introducing the reader to this boss "spinner," a short description of his scheme and how he came upon it will follow. Cliff had heard that a nearby mill was doing something to reduce "costs" in the spinning room, so he visited that mill to *learn* how it was done. As he studied their processes an idea came to him. He figured that one way to reduce costs was to reduce man labor, for a machine properly handled works cheaper than a man. Then he examined his bobbins carefully to see if they had all the yarn they could take. It occurred that the lower part of the bobbin might have more yarn wound on it, if the speed of the builder motion was cut down some for the first part of its traverse. Since the motion was uniform, because it was regulated by a uniform wheel attached to the worm gear, it appeared that the shape of this circle would have to be modified. Fig. 1 illustrates the motion as it was, and Fig. 2 as after the change. That part between line *E F* and the circumference *E H F* was cut out, giving the gear as shown in Fig 2.

It is readily seen that as worm *a*, Fig. 2, turns and gear *b* is moved forward, that chain *c* is not let off as fast as for the same number of teeth in Fig. 1, because the distance from *G* to any point between *E* and *F*, Fig. 2, is less than the radius of the wheel around which the builder chain is drawn. This motion, however, gradually increases as point *F* comes nearer to point *H*, or as *GF* becomes more nearly parallel to a horizontal line through the axis of the gear, as line *GH*. In other words, as point *F*, Fig. 2, moves forward the rate of speed is increased till it reaches the point *H* as compared with the let off from *F* to *H* in Fig. 1. From this time on the motion is uniform until the bobbin is filled. Since, however, the distance let off on chain *C*, Figure 2, is less than that let off on *C*, Fig. 1, for any given number of teeth on the gear during this period, it will require a longer time for the builder to make its full traverse. It has taken about nine per cent longer time to let off the same distance as in Fig. 1. There has been more yarn wound on the bobbin. The doffing time which is regulated by this motion is increased. The period cost being about nine per cent longer, the cost of doffing is proportionately decreased.

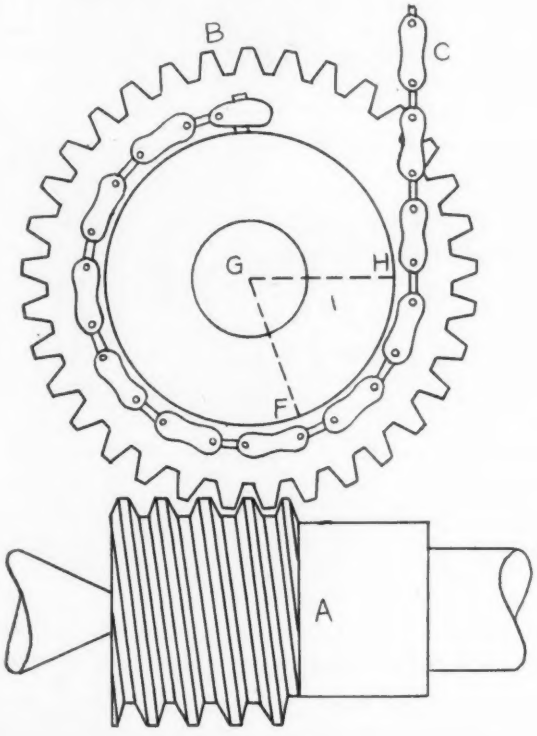


FIG. 1

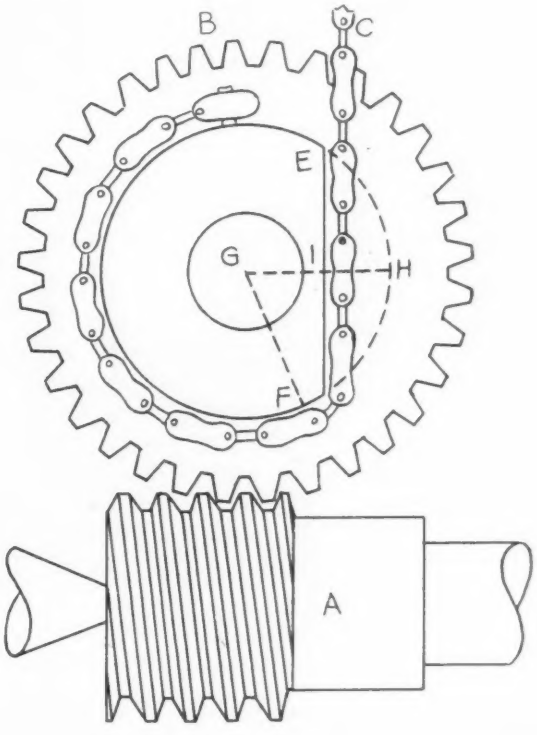
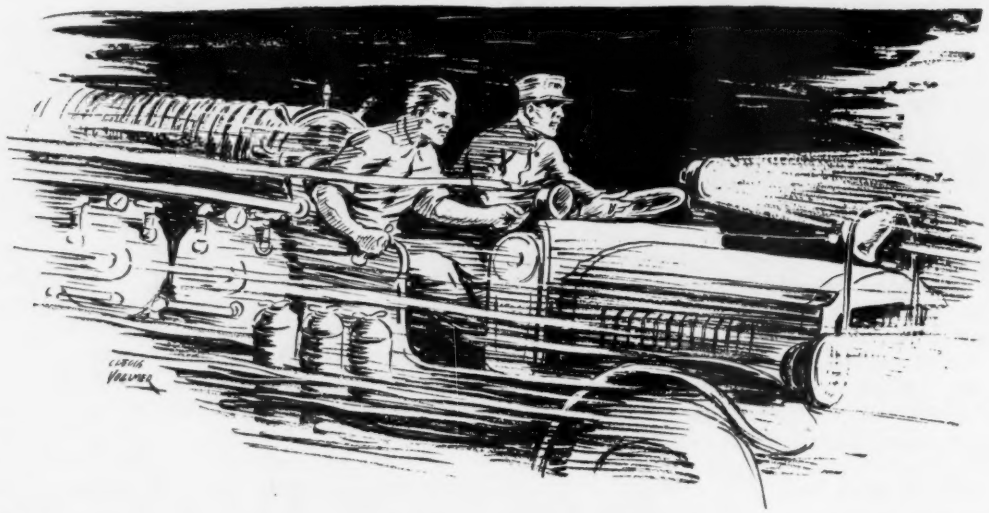


FIG. 2



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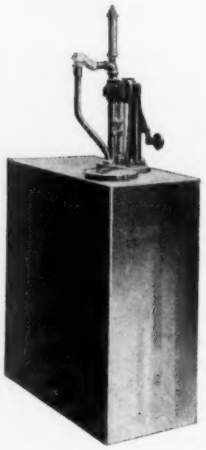

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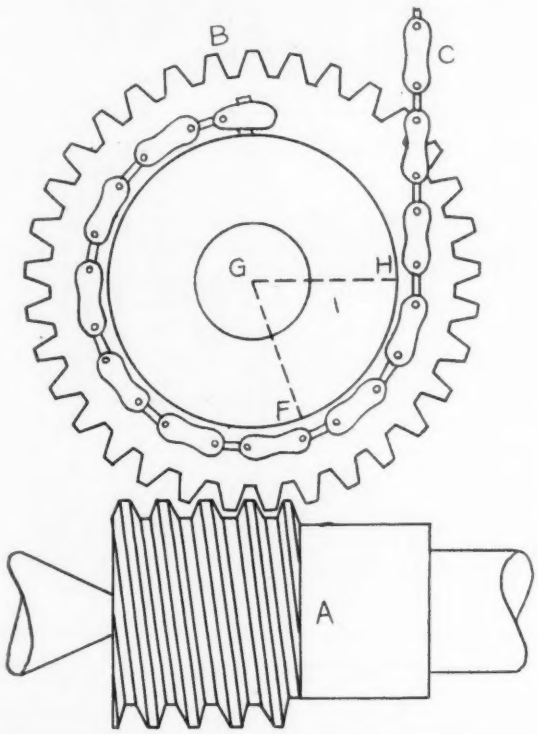


FIG. 1

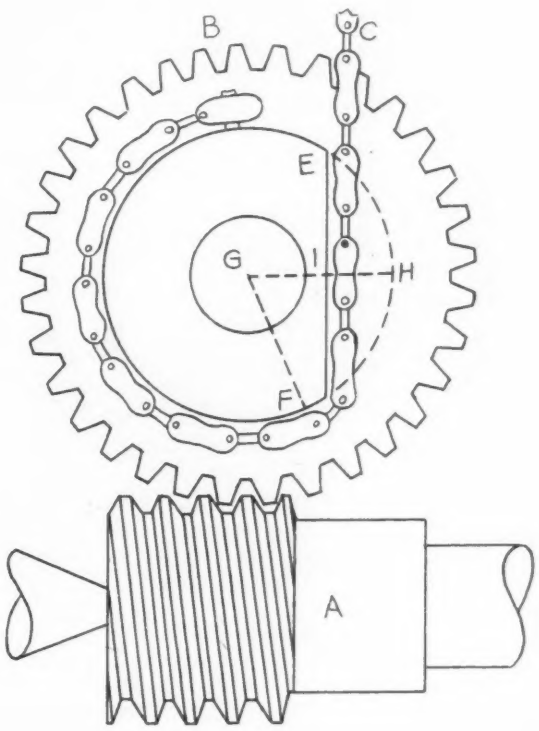
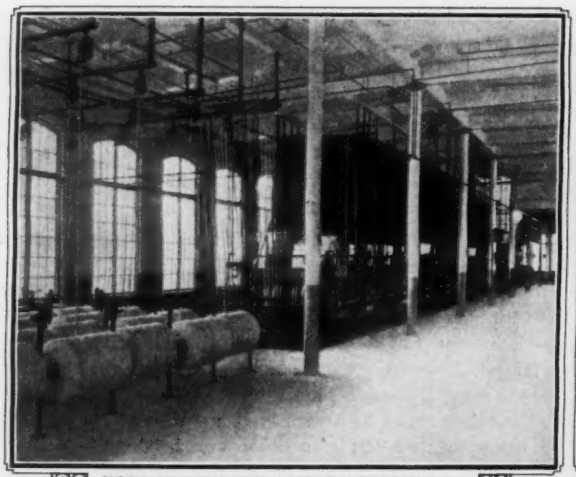
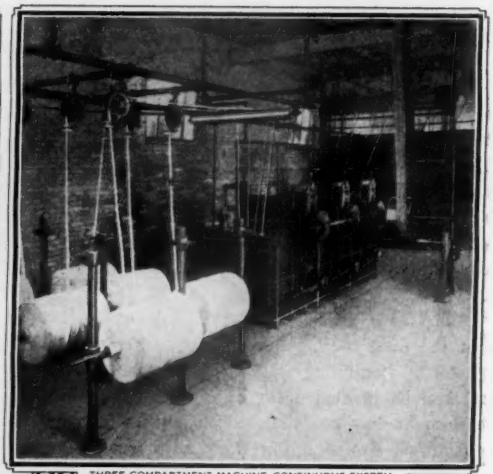


FIG. 2

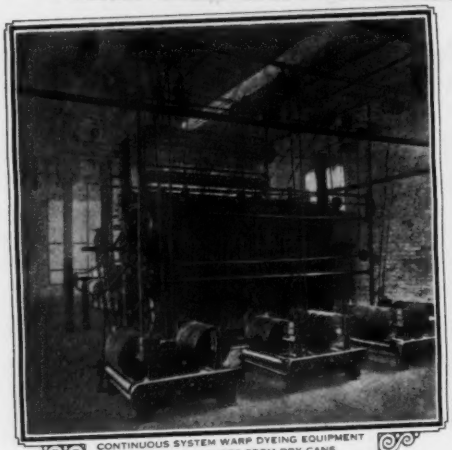
Warp Dyeing and Sizing Equipment



ONE RUN CONTINUOUS SYSTEM WARP INDIGO DYEING EQUIPMENT



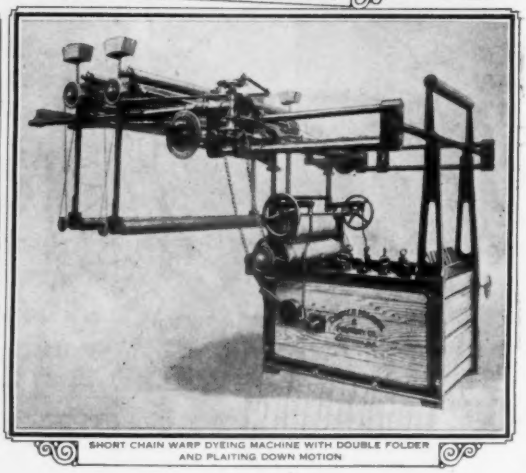
THREE COMPARTMENT MACHINE CONTINUOUS SYSTEM WARP DYEING EQUIPMENT



CONTINUOUS SYSTEM WARP DYEING EQUIPMENT BALLING SIX WARPS FROM DRY CANS

FIVE COMPARTMENT WARP DYEING MACHINE

SHORT CHAIN TWO-COMPARTMENT WARP SIZING MACHINE



SHORT CHAIN WARP DYEING MACHINE WITH DOUBLE FOLDER AND PLAITING DOWN MOTION

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Builders of Linking Warpers, Balling Warpers, Beaming Warpers, Balling Attachments, Warp Dyeing Machines, Beaming Machinery, Reels, Cloth Dyeing and Finishing Machinery.

This saving is made in the spinning room. Other things being equal, Mr. Kinsler says savings are made on down the line until all the yarn is off all the bobbins. In other words, it would seem to take nine per cent less handling in the spooler room on warps, and also in the weave room on filling, as the filling of batteries is reduced a like amount.

This appears to be a most excellent example of a man using initiative and not being satisfied with things just because he can get by, but looking for devices and methods of improving his room and making it more efficient at all times. CONTRIBUTOR NO. 81.

Uneven Tension on Fly Frames.

EDITOR COTTON:

There have been quite a few suggestions in answer to "G. D. S. (S. C.)" in reference to uneven tension on fly frames. "G. D. S." said his ends run loose at the beginning of the set and tight at the end of the set. One man recommends a change of the lay; another to build up on the bottom cone; and another a tighter rack gear.

My suggestion to "G. D. S." is to use a lay that covers the surface of the bobbin, the first layer not riding but be laid close enough to cover the bobbin. Then change the cone gear, which would be larger in the case the ends start slack. A gear should be used that will start the ends at the right tension with the cone belt one inch from the small end of the bottom cone. Then change to a larger rack gear instead of a smaller one, as suggested by "K. F. F." in a recent issue. "K. F. F." also states that "ten changes on a thirty tooth rack gear on Howard and Bullough speeders let the cone belt out more than ten changes on a thirty-four tooth rack gear. This is the case on any make of speeder." This makes me wonder if he ever changed the rack gear on other makes of frames.

T. M. (MISS.)

Card Settings and Gauges.

EDITOR COTTON:

I note in the May number of COTTON that "Contributor No. 14" gives his ideas on setting card flats. I take it that there are more different ideas about setting and grinding cards than on any other one thing in a cotton mill. I learned to grind under a man who used to grind the stationary or wood top flats. He told me that what "Contributor No. 14" calls "progressive setting" was used on the old-fashioned cards because the flats were stationary, and the flats nearest the feed or back of the card were clothed with coarser wire than those nearer the front. Since I have gone through the experience of grinding and I now have full charge of our card room, with the exception of hiring help and doing clerical work, I feel I can add my bit of information, in the hope that it will benefit someone.

I do not see any reason for setting one flat on a card differently from any other flat, for it is my opinion that the stock delivered by the licker-in sometimes is carried around by the cylinder several times before being delivered to the doffer.

And as to "loose and tight gauges," mentioned by several correspondents, I wish to say that "there ain't no such animal." A gauge is a gauge whether it be 5, 7, 10 or 12. What some call a "loose 10" may really be a 12 or a "tight 10" may be a 7. There is nothing definite about a "loose or tight gauge." A grinder should learn just how much resistance a gauge should have to be just right, and then treat every card as an individual unit, because I could not set every card exactly the same and get exactly the same results on any job I have ever tried.

I read "How Other Men Manage" each month and get lots of helpful ideas, and if my letter is worth printing I will come again and tell you my opinion on other questions in the card room. There are several questions that I may ask later. I. T. (N. C.)

Testing for Losses at the Slashers.

EDITOR COTTON:

I have read the slasher problem in the May issue submitted by "Contributor No. 2635." I believe any mill that thinks it is getting 75 per cent of the solids or sizing materials put into the size batches is doing remarkably well. From a thorough test just made on coarse yarns, very dirty stuff, weighing all the materials, I figured that 40 per cent of the starch, gums and softener disappeared; the 60 per cent was accounted for in the gain, which was the difference between the yarn weighed in and the sized yarn taken out. This test was cold size.

This size was made in the kettle in the regular way, 50 gallons at a time, run down into barrels to cool for two or three days before using. Then a shrinkage in bulk and weight takes place in the cooling process, besides a little loss from evaporation in the process of sizing. I believe the shrinkage referred to would mean about the same thing as condensation at the slasher running at boiling point. I remember previous experiences on slashers, and know the large amount of condensation taking place in a day's run on denims. We had to keep making up the consistency by adding more material, and at times, such as noon and morning, we drew off the size box and renewed it.

I should think that a modern mill, using up-to-date attachments and recording instruments, should get at least 60 per cent of the sizing material into the yarn. Of course some allowance must be made between very light sizing and extremely heavy sizing, as more condensation would take place when running very light work. And I believe that a good test, made in individual size kettles, carefully, with accurate weighings, would be surprising. I would suggest that as many as can, make a test for their own benefit and send in the findings to COTTON.

MACK (GA.)

The Standard Computing Scale Co., Detroit, Michigan, has developed an interesting improvement to the automatic scales they manufacture. It has perfected a tare dial to be used where gross, tare and net weights are desired. A lever at side of dial can be set to show tare weight, then when goods are placed on the scale the gross, tare and net weights are shown, all before the eyes at one time.

It is not necessary for the operator to figure out the tare weight, nor is there danger of incorrect total weight through an incorrect setting of the weight on the tare beam, it is claimed. This is an outstanding advantage in scale construction which is said to be meeting with wide favor among users of heavy duty scales.

Value of Twist in Roving.

EDITOR COTTON:

On the discussion page of the April number of COTTON appeared this heading: "What Is the Value of Twist in Roving?" signed by "D. A. D. (N. C.)"

In reply, I wish to say that the value of twist in roving from finisher speeders is, in my opinion, stronger roving. Now let's see what strength gives us in roving. First, we will have fewer ends breaking down at the fingers. Second, it will enable one to run a lighter tension on the ends. Third, there will be more wraps on the fingers. Fourth, more yards or pounds can be run on a bobbin, thereby less time lost in doffing. Fifth, it will wind off better and with fewer break-downs in the creel on spinning and fewer bobbins of roving for spinners to put in because of increased yardage or pounds to each bobbin.

But I wish to say that I am opposed to evolution. I am not going to accept the theory that God made man from a monkey. Now that brings me to my point. Anyone who wants to can make a spinning frame out of a speeder, but for me, I prefer to use both. In my opinion, if we had a speeder that would run a ribbon roving with no twist, it would make a more uniform thread, smoother and stronger. It would also run much better on the spinning. I should like to hear from others through the "How Other Men Manage" department on this. R. R. (N. C.)

EDITOR COTTON:

In the April issue of COTTON I see where "D. A. D. (N. C.)" wants a discussion started on the value of twist in the roving.

Let us first consider the value of more twist, or as I understand "D. A. D." a little more than standard.

(1) A little extra twist will aid the strand to overcome the slight friction of the hollow leg, and a full bobbin is built without a break.

(2) No matter how much the finger or presser pad is caused to press on the surface of the bobbin, if the stock is fluffy and the strand does not have a few extra turns to the inch the bobbin will be soft.

(3) A little extra twist will help keep down the fly in the spinning room, because this extra twist holds nearly all fibers, and this is a help to the spinner, simply because roving will hold together better, which means that the fibers in the cross section of the strand are not disarranged.

That is why roving packed away for weeks will not run as well. When I pack roving, I always insert an extra tooth of twist in all the roving to be packed.

The old idea of putting just enough twist in the roving to turn the skewer was long ago rejected by most practical carders that had the thinking habit. Conditions are reversed, as previously explained. (1) Lack of twist will cause the end to snap during the building of the set, because the friction in the hollow leg is stronger than the strand, and although many claim that less twist will give more production, that is only true when the strand is stronger than the friction in the hollow leg, which is great on damp days. (2) A lot of soft bobbins are made. Some ring spinners get the idea that it is single and refuse to creel them. They knock around the room for a few days and then are perhaps knifed. (3) A soft strand will allow much short fiber to escape and make a different diameter bobbin, due to the presser rods not being positioned

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ROOT COUNTERS

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alike on the hollow leg of the flyer.

The right amount of twist that should be inserted in the roving or yarn is obtained only by diligent study and experience. To judge, you must have the foregoing requirements. Then one can go to the mixing room and sample the cotton and right there decide whether the new stock requires more or less twist.

It should be known also that twist suitable for the winter months would not be suitable for the summer months. So then we must admit that there is much to consider when we insert twist in roving. The passage of the strand from the drawing rolls to the surface of the bobbins, the construction of bobbin and strand, the nature of the stock and its peculiarity, enough to turn the skewer in the proceeding process, or in other words, prevent the evil known as breaking back in the next process, length of staple and atmospheric conditions.

When a man is a good judge of all the foregoing items he is worth his weight in gold to a mill, because he can judge the number of turns to the inch that should be inserted for different mixings, and what might make conditions deplorable can be headed off, and instead, longer and better production can be turned off. WASH (R. I.)

EDITOR COTTON:

In regard to the request of "D. A. D." in the April number of COTTON concerning a discussion on the value of twist in roving, this reminds me of an experience I had at one time. I had just taken charge of the first card room I had ever run. The superintendent was a good old mill man and he knew how to grade cotton. I was getting on well and the work was running smoothly for the grade of yarns we made.

In the course of time a change was made in superintendents. The new superintendent was a spinner, not saying that a boss spinner does not know cotton grading, but in this case this fellow did not. The first man, the one who promoted me, was a carder and had had experience on down the line. He knew the importance of mixing cottons and grading. The new man naturally wanted to make a showing. We were making a yarn in which we could use some off-grades in light tinges, but that was about as low as we could get by on, so he bought the cotton for a little less, and he bought it regardless of the length and strength.

It was not long before I had to increase my twist for the spinner; it was breaking back in his creels. He had repointed roving skewers and done everything possible, but nothing would do but for me to increase the twist, which I did. Soon his work began to run worse and the breaking strength dropped down.

In those days we had no humidifiers. Things simply went from bad to worse. We did everything to hold up our production. It had gone down on us. We began to have all sorts of waste coming back to the picker room for remixing. This made bad matters worse, as we all know what too much reworked waste means. It made a still weaker yarn.

I went to the superintendent and told him that our cotton was just not up to its strength. He had a lot of confidence in me and I always tried to work to everybody's interest; so he said "Well, we have around fifty of the same bales of cotton on hand from last year, so we will go back on it and just see." We did. The spinner and I began to work on our waste all we could to reduce the amount going back to be reworked, and we got back on the good old sailing basis again in a few weeks.

Now I want to say that in the first place the twist in the roving is a very important thing. Too much twist, as we all know, will cut production and too much twist will ruin rollers, but above all things, good judgment should be used. There should not be too little twist, which will allow the roving to stretch and break back in the creels. Sometimes the cotton being run may be all right, it may have the grading quality in appearance but still it can be of a weak nature. In this case this cotton may grade up, but if the staple is weak it is sure to call for twist, and the idea of just having enough twist in the roving to carry the roving in the creel and not break back is no reason why it has sufficient twist. It can do this and still will be stretched in winding on at the speeder, and also in the creel at the spinning and then not break in two, but the yarn will be uneven. I really believe there are as many badly running spinning rooms today caused by this very evil as from any other cause.

Cotton mixing is of great importance, and where an overseer will go to the opening room, pull the cotton and make a study of it in the different mixings he will arrive at a mighty good idea as to what twist suits the work for his brother spinner, but he should pull it and break it in between his fingers and thumbs each time and then follow up this mixing, watching the results of the spinning. This is the place where the work will show up on his ability.

In closing, will say that there is no such thing as figuring the right twist for roving. There is a figured twist to be put in roving of a certain grade of cotton, but the right twist is gotten by the results to suit the special case just he same as a traveler on a spinning frame is arrived at to meet that special condition. I have never yet found two mills running on the grades of goods that under all conditions were the same. J. F. L. (ALA.)

EDITOR COTTON:

In reply to the request of "D. A. D. (N. C.)" for the opinion of others concerning the old idea of putting only enough twist in roving to turn the skewer, will say that my opinion, based on actual experience, is that roving needs more twist than barely enough to turn the skewer. I will give my experience along this line.

I had charge of spinning several years ago in a mill running 62s combed yarn from 12 hank roving. The spinning began to run bad and I looked for the trouble, but could find nothing wrong in the spinning room. The roving did not break in the creel and appeared to be even, but the end of the yarn where the ends broke had the appearance of thin places in the roving.

I went over the rolls carefully and removed every one that was not smooth; I set the rolls as close as possible to keep from making cockly yarn, but didn't get any results. I then asked the carder to put in a tooth of twist, which he promptly refused to do, saying that since the roving was not breaking back in the creels that was proof that it had plenty of twist. I then brought the superintendent to the spinning room and showed him the work and asked to have one tooth more twist put in the roving, which he did. I moved all the old roving from one side of the room and put in the new with one tooth more twist and the work began to pick up at once. As soon as the old roving ran out and we had the creels filled with the new, the spinning

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was running as well as ever.

I have also had the experience of too much twist in roving, which is as bad if not worse, than not enough.

C. A. M. (S. C.)

Potato Starch Sizing Formula.

EDITOR COTTON:

I note the request of "Contributor No. 4462" for some information that refers to potato starch in sizing.

As the inquirer wishes for a general potato starch formula I am concentrating my attention and remarks on a 26-inch gingham. From my suggestions he should be able to work out a satisfactory formula for each of his styles. A little experimenting and close attention to the results obtained will soon put him on the right road. The final criterion of any size mix is the weaving.

In the original question I note that he starts with 185 gallons of water. From this I assume that the finished volume of size is somewhere in the neighborhood of 225 gallons. For each 185 gallons of water I advise 112 pounds of potato starch. The starch should be put into water in batches of 35 to 40 pounds each; letting the first batch agitate while the second batch is being weighed, and so on. Then, the whole should be agitated for at least one-half hour before the steam is applied. It has been my experience with potato starch that the starch granules start to swell and burst at about 140 degrees F. Therefore I have always made it a practice to put the sizing compound and softener in the mix at this temperature. After the mix has reached the boiling point, 212 degrees F., just enough steam should be applied to keep it "rolling over" freely, and the cooking continued for about 40 minutes. The steam can then be turned off and the agitation stopped: the size being ready to use. In the size vat the size should be kept boiling to secure good penetration and to avoid laps on the cylinders, but violent boiling should be avoided.

With regard to the amount of sizing compound and tallow, I prefer to leave this to the inquirer, but I might add that with potato starch it has been my experience that more than 5 per cent—of the weight of starch—leads to soft warps, and again the warps do not open up well behind the harnesses, but the ends seem to cling to each other.

If my remarks bring any further questions to the mind of the inquirer, I shall be glad to answer them to the best of my ability. CONTRIBUTOR NO. 4468.

Tight and Loose Gauges and the Result.

EDITOR COTTON:

I have been a reader of your magazine for some time and enjoy it, especially "How Other Men Manage," and am taking the liberty of writing some myself.

In the April issue "R. H. (Ga.)" claims he can set to a loose gauge on his cards. In my opinion there is only one way to set with gauges. In setting cards I would use the following: doffer, .007; flats, .007; licker-in, .010; knives, .010; feed plates, .012. Set the licker-in to a .012 tight so that the .010 feels okeh. The knives and feed plate can be set to the required gauge as the licker-in fillet does not bend, but in setting the doffer or flats set to a .010 tight so that the .007 feels okeh. This insures an accurate setting.

Now, if "R. H." sets to what he calls a .007 loose, the chances are it is anywhere from .010 to .015 and possibly wider. On the other hand, if he sets to a .010 tight, it may be all right, but when the gauge is removed the wires might be touching, as the wire bends very easily.

The tight setting will ruin clothing in no time, and the loose setting will do poor cleaning, so it can be easily seen that a few more seconds used in setting will be well worth while.

I am sure that anyone who is setting to a tight gauge or a loose gauge will find he has a wide range of settings over his room.

In regard to a vibrating mill, it might be advisable to set the flats wider, especially on 45-inch cards, but the rest of the card is very rigid and does not need the wider settings. The flats can be sets wide without being set loose.

In the May issue, "C. S. F. (Ala.)" asks if there will be any difference in drafting a soft bobbin and a hard bobbin. I would say that if both bobbins sized the same they would draft the same. Twist and tension would make no difference in the drafting, providing the bobbins were equal in weight yard for yard. The only objection to a hard or soft bobbin is the difficulty of making it run well in the creel. B. E. R. (MASS.)

Outlines of Cost Finding.

EDITOR COTTON:

We are at a stage in commercial history when manufacturers are seeking ways and means to cheapen production, and I propose in this article to enumerate one of the chief items in business, a much neglected, until a few years ago, vital part of the duties of any business.

Before we can state the price of any article manufactured we must have placed the factory on a proper basis for cost finding.

We must have enough capital to pay for buildings, machinery, etc., and to carry us over a trading period until such times as we get a return for the labor and material used.

A. We have indirect costs that include the salaries of staff and foremen, rent of buildings, insurance of buildings, taxes, depreciation, interest on capital, and

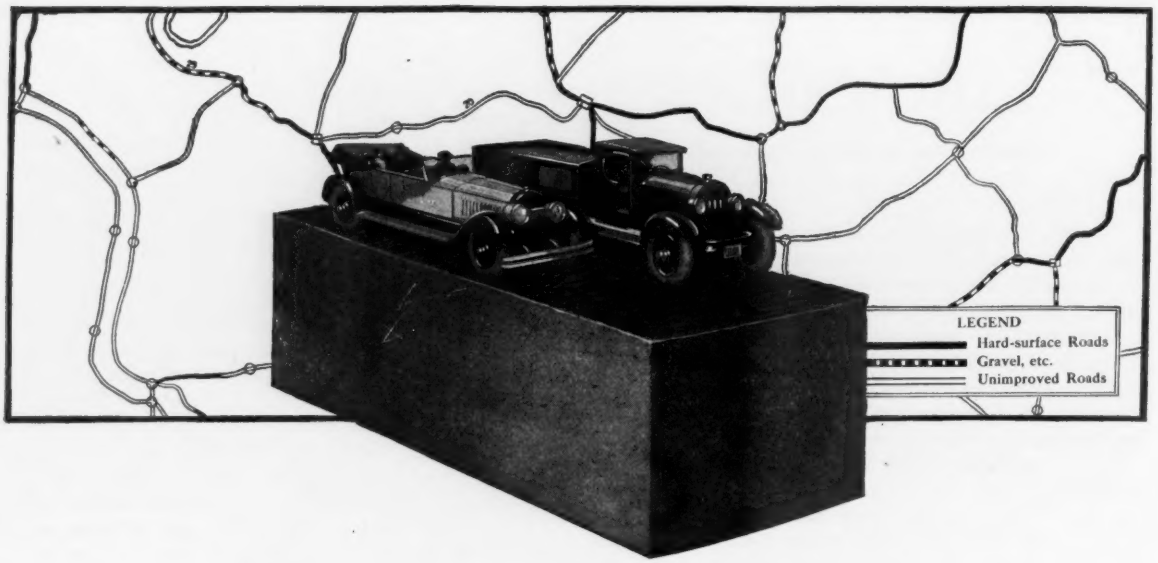
B. Direct costs such as raw materials, carriage of raw materials, cost of treatment of these including steam, water, power, lighting, wages, repairs, delivery charges, insurance, and taxes.

Having the foregoing, we are now ready to manufacture goods, but to make the business pay and earn profits, we must follow every detail and process throughout to enable the management to fix a fair competitive price.

What is wanted is accurate measurement, and rigorous examination of the evidence.

All scientific knowledge depends first on observation at first hand; say in three stages: First, observation, that is the recording and collection of facts; second, correlation, or the grouping and arrangement of facts; and third, generalization or the deduction of general principles. The first the foreman has a great deal to do with. The second is the work of the cost clerk. Third, the cost accountant or general manager must draw therefrom the general principles.

It is the substitution of this precise method of observation and the rigorous examination of evidence for the slipshod and indifferent methods of the past which constitute



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there are not more miles of improved roads at your service, is the brutally excessive annual cost of maintaining and repairing inferior pavements already laid.

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the scientific in the new system of cost finding. The object is two-fold. First, on the productive side, there is a check on methods with a view to the elimination of waste. Second, on the selling side, there is a guide to an economic or reasonable price.

Unless a strict account is kept of the operations showing their progress in black and white, converted into dollars, you have only a rough idea of the effect of what you are doing and may easily overlook waste. Cause and effect in modern industry are too multifarious for the unaided eye of man to follow; the separate facts must be stated and summarized and the result set down in clear understandable form.

The management must have constantly before it sufficiently detailed statements to enable it to point out the weak spots. The figures must be thoroughly analyzed; they must be thoroughly diagnosed.

What is essential to a cost accountant?

He must first thoroughly understand what he is aiming for; he must not be hazy or his resultant figures will be hazy. He must want to know first, what is the cost of a particular process, and second, what is the cost of the finished product. Then third, what is the cost of a particular order.

By process, I mean each individual production center such as one finds in a complete cotton mill, opening, carding, spinning, spooling, warping, beaming, slashing, twisting, weaving, dyeing, printing, finishing, make-up and selling. Each and every department must be checked separately, and each process or order as minutely as possible. If cost finding sheets for each style or order are made out correctly space should be allowed for the exact cost of that order to be shown against the calculated costs.

The foreman is the man responsible for the exact booking of each process, the material used and the time occupied. He must superintend or book, first, production; second, time, and third, materials used.

It is essential that a record of production is made accurately for every department, separately or the final records are useless.

It is necessary that all work should be planned to save time, labor, and in some cases, very often, materials. To facilitate this every foreman should be given a knowledge of the necessity of the time for delivery of orders.

It may be policy sometimes to run through various orders together, say in the dyehouse, but time of delivery must not be sacrificed to enable that to be done. It may not pay. Penalties sometimes occur for non-fulfillment of contract which may wipe out all the gain won in the first instance.

Time is one of the first essentials in cost finding. A great many of the factors in cost increase greatly according to the amount of time spent thereon. So that the management must know the exact cost of each process; they must know the hours or minutes spent on each process. So far time is an important item in determining three separate and important items: First, wages; second, on costs or fixed charges; and third, steam and power.

So far as an average process cost is concerned it is no doubt sufficient to know the number of hours which that particular machine or process is working.

In time keeping for working a process, working time is meant.

The process of getting ready must be taken into con-

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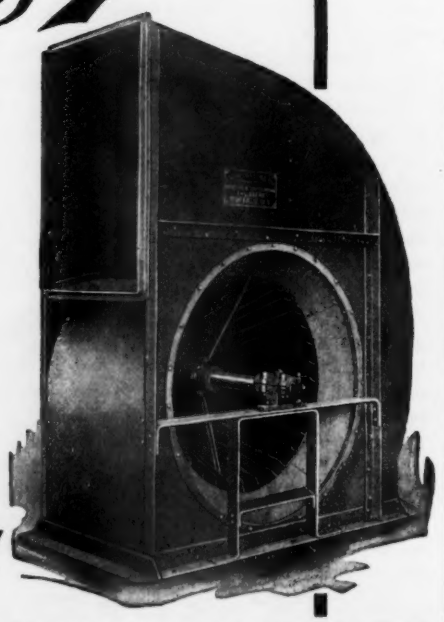

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sideration. It will vary in proportion in actual running time according to the length of run or size of order put through the process. How much can we charge for short running time and how much can we allow for longer runs. To ascertain this it is necessary to know the number of hours spent in getting ready. Taking costs more deeply, it may be necessary to know the amount of time spent on each individual operation, as if a bonus (premium) system were introduced, the time occupied on each individual operation would be required. There are some employees who do not like their time constantly supervised and checked, so the better way is to fix up some automatic recorder which shows the number of yards run.

In cost finding time is required as a basis, not only in the wages charge, but also for fixed charges, such as depreciation, repairs, rent and interest, steam and power, which are always accruing as time goes by. Each hour and each process should bear its own burden. When we know the number of hours a process or machine is working, we know what proportion of burden should be charged to it, and what proportion to charge against time.

The next item is the almost equally important booking of material, particularly of drugs, dyestuffs, etc., in dyeworks and bleaching departments. These materials must be accurately checked.

It is important to note also that in the selection of materials of any nature, the exact type and quantity must be used. In various departments these are determined by the man responsible for the handling of the order. In the case of cloth, the yarns and style are selected by the designer, and in the bleaching and dyeing departments the chemist. In other cases the foreman plays an important part.

The foreman must know the exact quantity of material required and must book or supervise the booking of such and see that it is done in a thorough manner. When it is realized that the selling price and scales of prices are to be based on these figures, then the importance of accuracy will be seen.

These two matters, the booking of time and materials, lead to another object, that is, the elimination of waste—waste time and waste material; this is one of the functions of a foreman. Waste arises from putting in unnecessary operations; neglecting to put in exact quantities of material, bad work, or work having to be done over again. To deal with this it is necessary to find out where this occurs. No one believes all bad work will be eliminated, but it can and must be reduced. In some cases it can be reduced by more scientific thought and care by the foremen, superintendents, chemists, etc.

Foremen should be shown clearly each week or month for preference the costs of running their department, stores and other costs itemized.

Then there are the costs or standing charges when idle. These are four: First, rent, depreciation and repairs. Second, management. Third, steam. Fourth, power. To deal with them in a proper manner, the machine or spindle hour rate by which costs are allocated to departments and machines, should be converted into rates per hour.

In weaving, the width, length and picks put into actual cloth per hour must be accurately noted as well as the power supplied for weaving, the loss per cent on the power supplied, must be entered against same.

Some may ask, why go to all this trouble to ascertain

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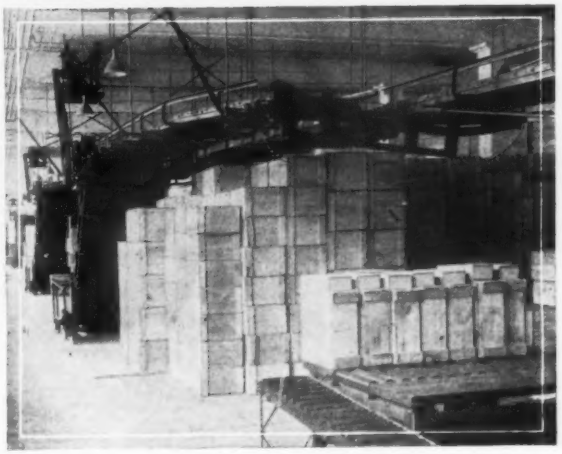

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what the costs are, rough averages answered years ago, why not now? It is plainly stated today, margins are finer and we must cut costs somewhere, and that is what we are out to find by checking these minute details. In recent years the advance in science taught us the importance of small things.

As industries and processes become more complicated and detailed, so must cost finding follow suit, and my idea is that if a mill or factory fails to adopt the scientific idea of cost finding, then in the natural sequence of events it is bound to lose money, in other words lose business by competition with more farsighted competitors.

I should add before concluding a very important item, that is to treat the generating plant, whether of steam boilers, steam engines, or electricity and the repair shops as a separate concern selling to the rest of the factory. It is no use to check your materials accurately and lump your steam and power, also the repairs, onto each department. These two items have been in the past sources of invisible loss. Register the power and steam supplied to each department, and work it out at so much cost per ton of coal used or unit supplied per hour.

C. W. (CANADA).

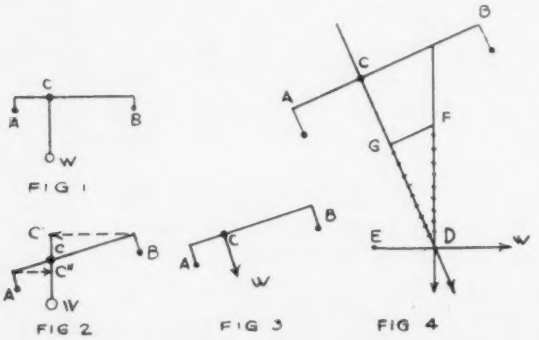
Figuring Weights for Top Rolls in Spinning.

EDITOR COTTON:

While reading the February issue of COTTON, I noted the method of "G. S. T. (Ga.)" in figuring the weights for top rolls in spinning. I agree with him in his method of figuring, but he has overlooked the inclination of the weight-hook in the system depicted. I hope to prove my point without entering upon actual calculations. I shall for simplicity, send four figures.

If a saddle *A B* (Fig. 1) rests horizontally upon two rollers, and a weight *W* is hung at *C*, it is an easy problem to find how much pressure is put upon the rollers at *A* and *B*. In the same way, if the saddle is inclined as in Fig. 2, the hanging weight *W* can readily be found to give similar pressures upon *A* and *B* as in Fig. 1, because the relative horizontal distance of *A* and *B* from the direction of the pull of the weight *W* remain unaltered.

Again, if the saddle is still inclined as at *A B* (Fig 3.) and the weight is made to pull in the direction of *W*,



which is at right angles to *A B*, we should work out the pressures on *A* and *B* exactly as in Fig. 1 example; but in Fig. 4 we find a combination of the arrangement 2 and 3, in which a pull is exercised in the direction of *W*, this pull being produced by a weight hanging vertically. Fig. 4 illustrates the meaning. *A B* is the saddle, *C D* is a link hooked to the saddle and to the lever weight *E W*. *W* hangs vertically and produces a pressure at *D* in a vertical direction; this pull is exercised along the link *C D*, so that in consequence of the inclination of *C D* a portion of the pressure produced by *W* is inoperative on *A B*. An easy manner to find the effective pressure produced by *W* upon *A B* is as follows:

Assuming a 2 pound weight *W* gives 10 pounds pressure at *D*, measure off a vertical line at *D* ten-given-distances, such as quarter inches; now draw a line from *F* at right to *C D* cutting it at *G*; if we measure *D G* and note how many quarter inches there are in it we obtain the number of pounds pressure along *C D*.

Among several tests conducted it was found that the pressure upon the saddle at C was about ten per cent less than that produced by the weight *W* at *D*. Then in "G. S. T's" example the pressure would be as follows:—total pressure, $19 \times .90 = 17.1$ pounds. Pressure on the front roll, $13.5 \times .90 = 12.15$ pounds. Pressure on back saddle, $5.5 \times .90 = 4.95$. Weight on the back roll, $3.3 \times .90 = 2.97$ pounds. Weight on middle roll $2.2 \times .90 = 1.98$ pounds.

A. N. (MASS.)

EDITOR COTTON:

In the February issue of COTTON I note that "G. S. T. (Ga.)" has an article giving rules for figuring the weight upon the top rolls. According to correct mechanical rules I figure that the gross weight brought to bear upon his top rolls would be close to 16½ pounds instead of 19 pounds as he figures. He states that the distance between

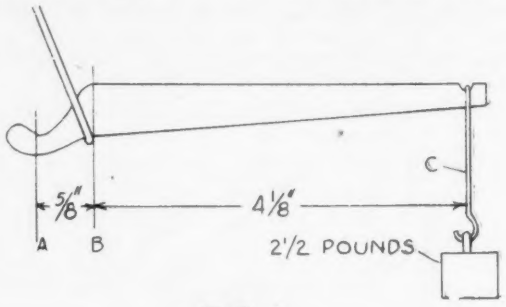


FIG 1

the point of suspension of the weight lever within the stirrup and the fulcrum is ⅝ inch and that the weight is 2½ pounds, which is hung 4⅛-inches from the point of suspension within the stirrup as in Fig. 1.

Now if the following rule be followed the correct weight upon the top rolls will be properly ascertained: Multiply the distance between *B* and *C* and divide by the distance between *A* and *B* thus:

$$\frac{2.5 \times 4.125}{.625} = 16.5 \text{ pounds instead of 19 pounds as ascertained by the rule published.}$$

In order to prove that this corrected rule is o.k., I will illustrate it as follows:

Let us suppose that we have a lever 10 feet long, and that we will rest it on a pivot exactly in the center. Now if we will have a weight on one end, five feet away from the pivotal point, and another weight at the opposite end five feet away from the pivotal point, one 100 pounds weight will counterbalance the other 100 pounds and we will have a perfectly balanced arrangement as in Fig. 2.

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Now we know that 100 pounds will perfectly balance another 100 pounds when they are hung on a lever which is resting on a pivot exactly in the middle. 100 pounds could not possibly lift or balance more than its own weight. Proof: Multiply the distance between *B* and *C* and divide by the distance between *A* and *B* thus:

$$\frac{5 \times 100}{5} = 100 \text{ pounds.}$$

But if we multiply the distance between *A* and *C* and divide by the distance between *A* and *B* thus:

$$\frac{10 \times 100}{5} = 200 \text{ pounds.}$$

According to this rule the 100 pounds would have to lift 200 pounds or two times its own weight. Now if we

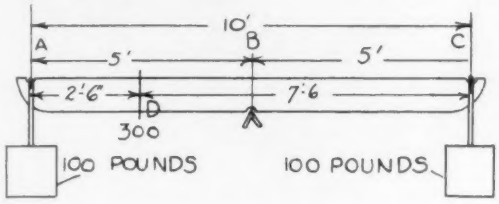

FIG 2

fix securely the point of the lever *A* and place the fulcrum at *D*, the distance from *D* to *A* will be 2½ feet. From *D* to *C* the distance will be 7½ feet. Now if we follow the corrected rule as given, viz.

$$\frac{7.5 \times 100}{2.5} = \frac{750.0}{2.5} = 300 \text{ pounds that the lever will}$$

pull down on a stirrup at the point *D*, or it will bear down on anything underneath at that point to the extent of 300 pounds.

But if the rule given out by "G.S.T.(Ga.)" is followed thus:

$$\frac{10 \times 100}{2.5} = \frac{1000}{2.5} = 400 \text{ pounds,}$$

it figures out 100 pounds more than it is possible for the weight to lift. H. D. M. (S. C.)

Worn Pins in Flyers.

EDITOR COTTON:

At the Textile Show in Boston, I was handed a pamphlet, which read in part:

"Are your flyers worn in the let-on, that is, in the part that fits over the spindle, allowing the flyer to shake? This condition is not the very best thing that ever happened in the making of good roving."

What a point these people missed! A worn pin that causes the flyer to shake on the spindle will stretch the strand every time the frame is stopped and started.

Please remember that we have in our mills that system known as the bobbin-lead. As the bobbin leads the flyer during winding, any hesitation of the flyer will cause stretched roving. To prove this, find a flyer with a worn pin, and when the set is full, move the flyer back and forth on the full bobbin and mark at the end of the pad at each movement. One will be surprised at the space. This is what causes the ends to snap on an old frame when the frame is started and then stopped.

I will admit, and many other mill men will admit, that we neglect the flyer service offered by such companies. I dare say, if the men at the helm of our cotton mills knew the harm a worn pin or flyer will cause, they would keep such shops running day and night. WASH (R. I.)

Paging the Card.

EDITOR COTTON:

In reading the August, 1924, number, I have read carefully the article, on page 1015, on paging a card, by R. A. Soniaman. This article surely treats the subject very thoroughly and will do any carder good to study it carefully. I am going to comment on parts of it, not trying to condemn them, but writing from my own experience and agreeing in most all cases with the writer.

I honestly believe that too little care is given to the preparing and cleaning of the cotton in the picker room, many men depending altogether too much on the card and then condemning it. If we will carefully study the cleaning properties of the picker and experiment with different settings and speeds, we will be able to make them perform their full share of the work they were bought to do and will then find that our carding is greatly improved and when this is right there is very little complaint about the rest of the work.

I have talked with men who seem to think that anybody can take charge of a picker room, not even having to know why it is used, except to put cotton in the form of a lap for the card. Here an intelligent man is needed, one who can detect bad work and be able to remedy it, and one who will do this work without the Boss continually driving him to it. By this I do not mean that the Boss should neglect to oversee this room. It is necessary for best results that he follow this room very closely.

When we come directly to the work of the card, we should do some deep thinking. A great many carders are under the impression that the sooner the production can be put through the card the better for them. I know of carders who have made a very good name for themselves by following such a man and only reducing the speed of the doffer and taking the full number of hours allotted to put the production through. When we speak of stopping the card five minutes before stopping time at noon and night, and one or two hours at week end it does not sound great, but when we count it all up, and find we can slow the speed of the doffer, one or two teeth on the barrow gear, and still get the production in the engine time, and we realize the benefit derived by the better carding performed, we make a serious mistake if we fail to make the change. The work put upon the card strippers will be somewhat eased as laps will last longer, cans will not doff so soon and there will not be the same hurry about the work. The important thing is the setting of the card and I believe it is impossible for one carder to give to another the settings he should use. He may give him settings that are good for a start, but the conditions in his room may be so different that he must experiment to find the ones that will give best satisfaction for his particular work.

It should not be expected that a card can do any

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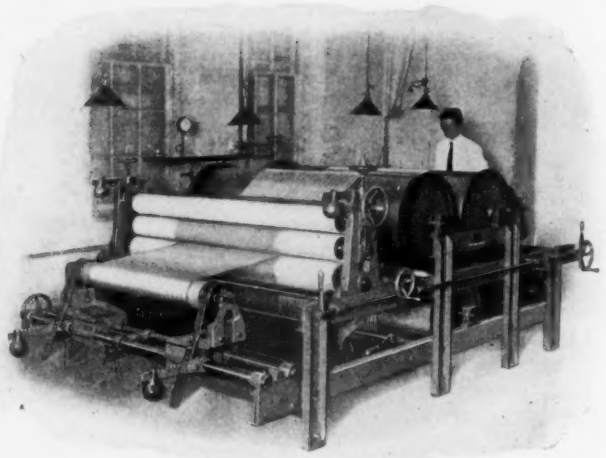

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amount of work and do it properly, any more than a finisher carpenter can do the best work and a good job if the man who does the rough work has not properly prepared his share.

The question of the correct number of wire depends wholly upon the class of cotton being used. It should not be decided by an office man, but by somebody who knows from actual contact with the workings of a card. It is a good plan to discuss this subject with the makers of card clothing, because they are in contact with a great many users of clothing and know its use under all conditions and are able to give advice that should greatly help.

Good grinding is very essential for the proper working of a card and too little attention is given to this by the overseer. They usually hire a man who says he is a grinder and instead of talking with him about the methods he uses he is allowed to go ahead and do as he pleases; later it is often found that his ideas about grinding are not the best and a great amount of damage is done. Possibly he has always been allowed to go ahead on his own and never had the various points explained to him as to right and wrong and only learned after some mistake was made.

I know a carder, who, when he received his position, made it a study to find the best available man. He hired this grinder and had a long talk with him about grinding and cards in general. He found he had ideas that were good and knew why, when and how a card should be ground, and when cards were producing good work. He always claimed that this grinder was his salvation and the means of him being so successful.

It seems to me that the mill officials are wrong in fixing the pay for card grinding at so much per week and not be willing to vary this price, except with the general change of wages. I believe better results could be had by placing the price upon the man, for you must pay the same whether the grinder is good or poor. When we come to realize that the grinder has the value of thousands of dollars under his care and one of the processes where the succeeding work can be easily spoiled, more serious thought will be given to the type of man we must hire for this position, I believe that better men would study card grinding if more value and pay was put upon the position.

I am a firm believer in setting to the gauge decided upon, not to a slack ten or a tight ten, for they mean nothing. You will invariably find that when parts have been set to a slack gauge it is possible to put in also another 10 or 12. There is another phase that must be considered, the touch or feel of no two men is exactly alike. I may set to what I call a good gauge and you may try the same and dispute it and rightly, but if I am allowed to do all of the setting, the feel at all points will be the same and this is very essential. I think too little attention is given to the settings of the flats and front plate, for it is here that the real carding is done and it needs careful study.

It is surprising to talk with carders about their settings and then try them and find how little they know about what is being done. I think this is likely to happen to us all, taking too much for granted, after having given instruction as to what settings are wanted but not trying them. You will find that the carder who occasionally goes along with the grinder and asks to try the settings after a card has been set up will get the best work; it keeps the grinder on his job.

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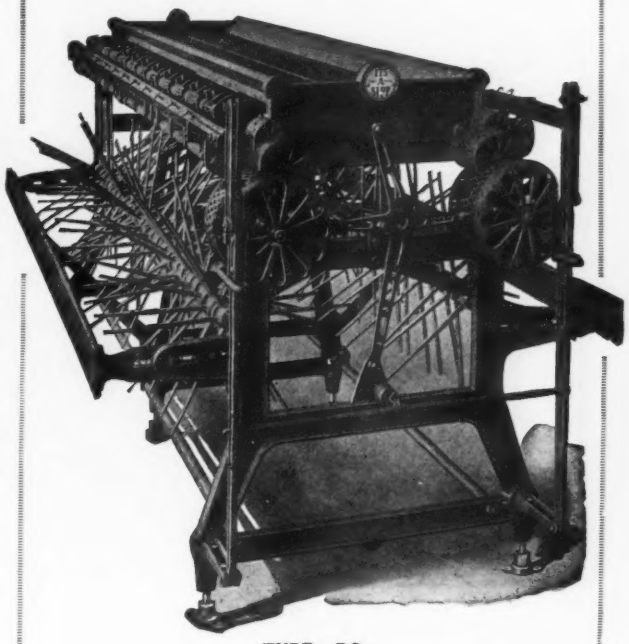

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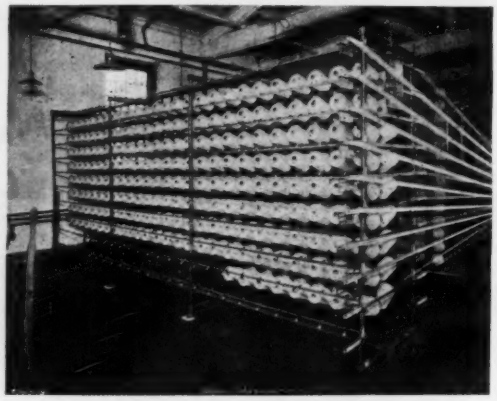

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It should not be expected that a card will produce good work if required to put through a large production. It seems to me that in the laying out of a mill, that the number of cards required are based on too high a production; the allowing of four or five more cards would not be felt at this time and the amount spent would be soon saved in the improved quality of the work, and the length of service of the card clothing would be extended a few years.

I suppose there will always be a variety of opinions about card drafts and a man will not be convinced of the advisability of making a change unless he carries through a great many experiments with various drafts. In some mills this would be impossible, for the carder is not allowed to make any change; in others he makes some start but other overseers are not interested enough to help him carry them through correctly. It is only when the superintendent is interested that full cooperation of the overseers is given and they begin to look for improvements. The layout in some mills is such that it would be impossible to make any change. Knowing this, it has a tendency to hold the overseer back.

The number of card tenders or strippers will always vary in different plants, there being a great many things that determine this, such as speed of cards, weight of sliver, number of cards, number of strippings and different work required of them.

When hand stripping is done I believe better results may be obtained by having some men take care of the cards and others take care of the stripping, of course arranging the rest of the work, such as carrying laps, taking off strips, taking out fly, doffing cans, cleaning and sweeping in such a way that the work is equally distributed. Too much care cannot be taken in laying in laps. I remember when I was a card stripper, I had changed from the old wooden top cards to the new revolving flat cards and we had a new overseer who came around often and in putting in laps showed us how to do so properly and explained why it should be done and the result of doing differently. That was a good lesson to me and I have tried to follow it. By explaining to the operative why a thing should be done in a certain way and the result if done otherwise he becomes more interested in his work and feels you have an interest in him.

In the stripping of cards various methods are used. When the card strippers all do the same work and must take their share of the brush, it seems hard to have them strip other than in rotation on two or more strippings a day. As far as finding variations in numbers due to this, there is some doubt, as the sliver of no two cards, started after stripping, are likely to come together at the drawing, there being at least one minute between the piecing of the sliver at the cards, and no card going to a particular delivery of drawing. This will be disputed, but I still contend that at the second finished drawing the variation will be no greater than if every other card were stripped.

When some of the strippers are running the brush it is possible to have them strip every other card and later take those missed. I have seen this done on two strippings a day, in the morning and at noon, the men stripping certain cards and at 10 and 3 o'clock stripping the rest. The number of times cards should be stripped a day is determined by the speed of doffer and length of staple, for good work on inch cotton a card with a 13 doffer speed will

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41 Park Row New York

need more stripping than one with a 10 doffer speed; also long staple having a tendency to fill up the wire sooner than short staple, will require more stripping. These items must be determined wholly by the plant management, they knowing their requirements.

The leaving of the cards at week end is worth considering and a great amount of work may be spoiled. Most mills let the card stop as it will, immediately starting them on Monday and taking in all dirt on the web. At one place I was visiting on Saturday forenoon, at about 9:30 all cards and draw frames were stopped, and hands took brooms and cleaned pulleys, shafting, hangers and ceiling, each hand having a given portion to cover. When all were through, they went at their cards and frames and cleaned them, then started them, breaking the sliver at the coiler and letting it run on the floor until the web was clean. I thought this was fine, the overseer stating that this was done twice each week. Another was breaking the sliver at the coiler Monday morning, allowing the web to run on the floor until clean and then piecing up. Another was stopping the feed when stopping the cards at week end and leaving the coilers open until Monday, after being cleaned, and then oiled before starting for the new week.

This will finish my comments on cards.

CARDER (MASS.)

Overcoming a Picker Difficulty.

EDITOR COTTON:

Please allow me space in your magazine for a few words in reference to a letter from "Wash (R. I.)" appearing in the March, 1926, number of COTTON under the heading "Keeping the Evener Motion Sensitive."

Will say that I have been in a picker room for fifteen years and had all kinds of trouble, though I have never had a cone worm to cause uneven work. The feed rollers will cause bad work. I went to a picker room once and the weights could not be kept. The first few days I was in the mill I found the needle aprons were slipping and making thin places in the breaker laps. I cut each apron and took out four to six slats. That increased the production some. I looked for some time before I found the next place—the cone belts were slipping from having too much oil in the cone boxes. I also found the fingers and finger rods were worn so a part of the fingers could be moved any time while the lap was in motion. I put in new fingers where they were needed and a set of finger rods. I soon had the spare floor full of good laps. I left the job running well. To take out slats in a needle apron on the breakers the apron should be again cemented just like they are taken apart. CONTRIBUTOR No. 1666.

Southern Textile Exposition.

At a recent meeting of the directors of Textile Hall Corporation, Greenville, S. C., which is now self-perpetuating under its new charter, the following directors were elected to serve for the ensuing year: John W. Arrington, W. W. Carter, J. F. Gallivan, B. E. Geer, Edwin Howard, John A. McPherson, J. E. Sirrine and William G. Sirrine, Greenville, S. C.; Cason J. Callaway, LaGrange, Ga.; George H. Lanier, West Point, Ga.; L. W. Robert, Jr., Atlanta Ga.; Donald Comer, Birmingham, Ala.; Fred O.

Guaranteed Trees and Shrubs for Your Own Home Grounds

Years of experience in growing and planting trees, and an intimate confidence and knowledge of our own stock, enables us to make an unusual sweeping guarantee. We will replace at the nursery any of our stock which dies within a year after we have planted it.

Our Guarantee is Your Protection

This is a safeguard doubly appreciated by those who must consider both economy and the permanent beauty of the planting about their homes.

Let us serve you now. Our representative is probably in your vicinity and will be glad to call on you. Drop us a line, or wire us, for an appointment.

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Nurserymen and Landscape Gardeners

10th Avenue, Hickory, North Carolina

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NOT A TWISTED EYE In "GARLAND" Cabled Twine Loom Harnesses

Our experience shows that for all ordinary weaving, cabled twine loom harnesses weave best and wear longest. This twine is hard to knit and difficult to finish but our harnesses are so carefully made and so thoroughly inspected that every cabled twine harness which we send out is smoothly finished and free from twisted eyes.

GARLAND MFG. CO.

SACO, MAINE

Tyler, Anniston, Ala.; Robert I. Dalton, Rogers W. Davis, B. B. Gossett, J. Norman Pease, Charlotte N. C.; S. F. Patterson, Roanoke Rapids, N. C.; Carter Lupton, Chattanooga, Tenn.; H. A. Ligon, Spartanburg, S. C.

Plans for the 7th Southern Textile Exposition are being rounded into shape. The applications for space have been so great that the steel building to be erected by the Truscon Steel Company has been twice enlarged. It will measure 60 x 200 feet, and will be immediately alongside the main building, reached by three wide galleries fifteen feet long.

Some changes have been made in the balcony, materially improving facilities in that part of the building. The tier of seats on the Washington street side have been removed, the resulting space floored over on the same grade as the stairway landings. This provides much additional space. A wide door overlooking the second floor has been cut into the mezzanine room. This will be used for a men's Club Room. It will be exclusively for the use of visiting mill presidents, superintendents, overseers and other subheads of work. Exhibitors will also have cards.

The Club Room will be operated by a committee of Greenville citizens and will be furnished with easy chairs, tables, telephones and other conveniences.

The following Advisory committee has been named: Milton G. Smith, Chairman; David Clark, W. R. C. Smith, V. E. Carroll, C. Randolph Bennett, A. H. Cottingham, M. O. Alexander, T. A. Sizemore, W. P. Hamrick, S. M. Beattie, W. H. Porcher, and H. R. Fitzgerald.

An Improved Automatic Eye.

The U S Bobbin & Shuttle Company has just placed on the market a new improved eye to aid in securing perfection in automatic weaving. The front pitch of the eye has been increased so that it is claimed the filling positively cannot ride the eye, and will get into the outside delivery eye on the second pick after the bobbin transfer. It is said that experiments made under actual weaving conditions show that this improvement positively eliminates shuttle cut filling.

The back safety catch has been lowered to prevent broken filling on the transfer in short draught shuttles. Loops over the top of the eye, and over the whole eye will pull off and re-thread without breaking back, it is pointed out and quick, positive threading is the inevitable result of these improvements, resulting in more production, better cloth, and satisfied weavers.

The special features of open eye for soft filling, medium tension for rayon and regular cotton counts, and heavy tension for worsted and hard-twisted filling developed by this company are retained in this improved eye.

The U S Bobbin & Shuttle Company offers every mill an opportunity to test this improved eye without cost. A shuttle made to your specifications and equipped with the new improved eye will be sent to any mill on request.

Saylesville Bleachery Company have awarded contract to Jefferson & Weedon, of Boston, for 27 kier circulating devices. Twelve of these kiers are to go in the new plant at Asheville, N. C., the others in the New England plant. Jefferson & Weedon have recently furnished kiers and circulators to the Belmont Processing Company, Belmont, N. C., and the Savona Manufacturing Company, Charlotte, N. C.

For some months there has been an increasing interest in a mixed cotton and wool yarn, such as is used in the manufacture of merino wear. A machine for cutting the wool to the same length as the cotton staple with which it is to be blended, for use on cotton spinning machinery, has been placed on the market by F. J. Stokes Machine Co., Tabor Road at Cedar Grove Station, Philadelphia, Pa. A view of the machine is shown in the accompanying illustration.

The machine, it is stated, will cut from four to eight ends of wool roving from tops wound in the ball form, at

the rate of 250 cuts per minute. The length of the cut or staple can be adjusted for any length from ½ to 3 inches, and is uniform. The capacity of this machine is 800 to 1000 pounds per day. The machine is furnished with a ½-hp. motor, stands four feet high, and weighs 600 pounds, with the motor.

Cotton growing in northern Australia is increasing and cotton manufacturing is getting a start there, according to Joseph M. Merrow, president of the Merrow Machine Co., Hartford, Conn., who recently returned from a four months' trip to Australia, New Zealand and the South Sea Islands. Mr. Merrow was accompanied on the trip by his sister, Miss Mary W. Merrow. While in Sidney, they attended the annual exhibit and races, which occurred almost simultaneously with the exposition at Dunedin, New Zealand. Here, Mr. Merrow stated, he saw the first cotton goods manufactured in Australia. The country has recently put a new tariff on manufactured goods, giving an impetus to manufacturing, he pointed out.

Newport Chemical Works, Inc., Passaic, N. J., have issued leaflets on two colors, Newport Anthrene Jade Green Supra and Newport Thianthrene Pink FB Paste. The former, it is stated, is suitable for dyeing in all types of machines either as a self-color or in combination with other vat dyestuffs. The company states it is the most brilliant type of vat green produced. The pink paste is characterized by its clear bluish tone and general fastness properties, it is stated. Both are adapted to cotton, rayon and silk materials, it is pointed out.

Knitting Section

In step with the market

B-Vertical Floating Striping Machine

B-Vertical Floating Striper and Dot Machine

***B-6 Machine**

***B-7 Machine**

THESE machines offer a variety of styles and colors to meet all demands. Simple patterns may be produced on these machines as well as the more comprehensive styles containing a multiplicity of colors, checks, dots, etc., incorporating in one machine the advantages of all these desirable features.

***Models B-6 and B-7**

These machines are built with six and seven yarn feeding fingers, respectively. These machines are of floating vertical stripe design. The vertical stripes are produced by groups of knitting needles knitting with one or two yarns used for plaiting, thus producing a perfectly clear and positive vertical stripe of a greater width than can be produced with reverse plaiting needles, particularly when using worsteds or soft yarns on coarser gauges.

The vertical stripes can be located throughout the circumference of the stocking as desired, by the use of jacks under the needles to produce the vertical stripe of the width desired.

These machines will produce repeated horizontal stripe patterns of any design up to 48 courses, if two or more course width stripes are desired. Repeated patterns up to 24 courses can be made if single course stripes are incorporated in the pattern.

The vertical striping attachment on these machines is so arranged that when making plaids or checked patterns small squares can be inserted in the middle of the check or vertical stripe.

The above machines can be set up for either men's half hose or ladies' hose, if desired.

Established 1865

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366 Broadway New York

NEW ENGLAND SPUN COTTON YARNS

We Twist these yarns in Any Number of Plys desired
We Spin Cotton Yarns in All Numbers from 1's to 100's. from 2 ply up.

We Furnish these single or twisted yarns to suit your own particular purpose. Any Twist you say.

We furnish them on Cones, Tubes, Spools, Bobbins, Warps, Beams, Skeins—Gassed or Ungassed.

We can furnish the above from any Staple Cotton you desire.

COMBED and CARDED AMERICAN or EGYPTIAN

and behind all this an Organization that has been Spinning Yarns for Years and Years.

We recommend

QUISSETT QUALITY YARNS

SPUN FROM

EARLY BLOOM COTTON

QUISSETT MILL

NEW BEDFORD, MASSACHUSETTS

80,000 SPINDLE

QUISSETT MEANS QUALITY

Some Finishing Operations on Knit Goods

BY WILLIAM DAVIS, M. A.

The processes which occur after garments have been cut out are many and varied, and chief among these are the stages of trimming the articles to make them ready for wear. This includes not only the seaming of the constituent garment pieces to assemble the garment, but many of the minor operations of trimming such as making buttonholes, attaching buttons, adding tapes and making eyelets. Small pieces have also to be put on to the garments at certain vital parts, and in these processes it is possible to waste much valuable time by the use of methods and machines which are counted out-of-date.

In the making of pants and trousers for example, the waist portion must be reinforced by the addition of cotton beige material to the top three inches or so, as this has to be given a shape which will impart some semblance of elegance to such a prosaic article. In doing this there are two main practices. (a) The part is knitted or cut shorter in the body and the beige band is attached as a combination of the knitted part. (b) The body is knitted right to the full length and the beige cotton fabric is placed on top of the waist so that the fabric is then two-ply. In comparing systems (a) and (b) it will be noticed that by the system (a) we can economize in cost as the knitted fabric is reduced several inches in length at the waist, which makes an enormous reduction in the weight of yarn needed for a quantity of goods; (b) gives greater strength, warmth and support at the waist portion; greater care can be taken of that vulnerable part, the lower spine, and the article is altogether of improved style.

Attaching the cotton cloth is usually done with the two thread lockstitch machine where the speed of machine is from 3,200 to 3,500 stitches per minute. The upper thread comes from the reel and the lower thread issues from a circular bobbin located in a shuttle. These two threads lock each other firmly, the upper thread being placed under the lower thread and the two drawn tightly in the center of the fabric. This stitch has the merit of holding the two pieces of fabric with great rigidity and is a great advance on the single thread chain stitch system which can be unravelled with ease, once the thread gets broken.

We have also seen large quantities of such goods trimmed on what is known as the double lock chain stitch which occupies a place quite its own. The ordinary lockstitch is firm but in connection with the knitted fabric, it is sometimes too firm to suit the purpose fully. The knitted stitch is stretchy and it is in general an advantage to employ a stitch which is more elastic than the lockstitch. The chain stitch is much more elastic than the lockstitch, but as has been stated, unravels easily. It will be seen that if one can combine the firmness of the lockstitch with some of the elasticity of the chain system of stitch formation we shall have an eminently satisfactory stitch for the knitted garment. This is found in the double locked chain stitch where two threads are employed which lock firmly, but they intersect on the more elastic principle of the chain stitch and they are produced on similarly high-speed lines.

There are various minor operations of stitching of non-vital parts where the ordinary single-thread chain stitch can be usefully employed. In certain tapes, or small pieces of ribbon, we use fabric wound round at each edge and stitched in chain stitch. This is done on the single thread machine at a high speed of 4000 stitches per minute, and as the item is not subjected to special pulls, it is quite a suitable way of doing it. In turning round two edges of the narrow tapes or in attaching the wider bands to the fronts of knitted shirts, it is now considered out-of-date to run the sewing down one side and then down the other at a second operation. The sewing machine firms now supply machines with two or more needles with their corresponding bobbins above and shuttles beneath the fabric. In addition to these rows of stitching simultaneously produced, the fabric, cut to approximately the correct width is automatically turned around, and immediately thereafter attached to the garment. Until these machines were perfected, the bands were made as separate items and attached subsequently, very often by the single needle machine. It is clear that any firms who still follow the single line method are at a grave disadvantage compared with the double-line process.

The band of the pant is sometimes the field of endeavor for fancy styles of stitching which firms adopt in an effort towards individuality. They have simple schemes of curves and lines composing a kind of design which in addition to ornamenting the band, serve to keep it from bulging or getting out of position. Such stitching can be added very effectively by means of the plain single-thread chain stitch machine. If one might mention the chief fault in this department, it is that the materials used are too often of inferior quality and any wearer can testify that the bands, tapes, etc., often are in rags when there is still a great deal of wear left in the knitted article itself. It is too little realized that such parts have enormous wear to withstand and the reputation of the firms' productions can be adversely affected by poor quality of trimmings. The tapes are added for the insertion of the suspender, and when these wear out, the article cannot be kept in the correct position. The loose manner in which buttons are attached to such garments with only a few threads or foundation is also notorious, and more attention to such apparently trivial matters is long overdue.

At the back of the pant, a gusset is inserted by making an incision and inserting a piece of cloth which is drawn together or let out to suit the changing conditions of width of a wearer. The drawing together is done by means of a tape which is inserted into holes in the fabric. Now the pulling of the tape on ordinary fabric would quickly draw the fabric out of shape and make it unsightly and the eyelet is therefore added. A small piece is excised from the cloth and the needle plus a shuttle work together to place around the hole a reinforcing wall of lockstitching, put closely together to obscure any ragged edges of the cut fabric and greatly augment the wearing power of the aperture. Needless to say, an opening of this kind must be rendered absolutely rigid and firm, as it should not yield when the tapes are drawn tight. These are made by having the fabric secured by what is termed a rotating feed dog where the needle moves out and in over a fraction of an inch, usually about $\frac{1}{4}$-inch and it penetrates the

The "BANNER"

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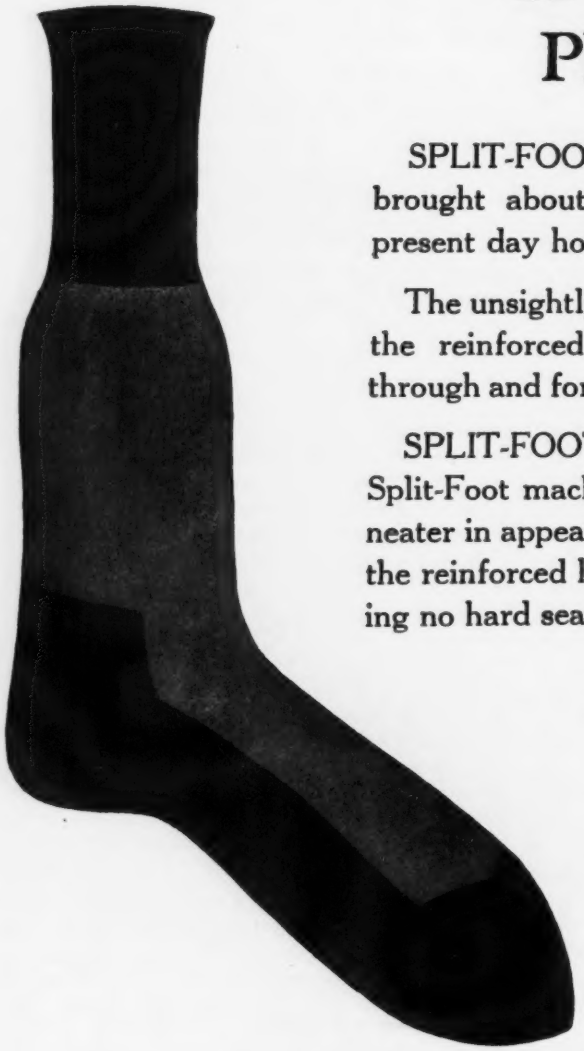

SPLIT-FOOT HOSIERY, the new creation, brought about by the main disadvantage in present day hosiery, namely:

The unsightly inside fringe of splicing ends in the reinforced portion which tends to slip through and form whiskers on the outside.

SPLIT-FOOT hosiery made on "BANNER" Split-Foot machines is smoother on the inside, neater in appearance and has added strength at the reinforced high splice and double sole, having no hard seams.

WHY MAKE AN INFERIOR PRODUCT?

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HEMPHILL COMPANY

Main Office and Factory

PAWTUCKET, RHODE ISLAND

New York Sales and Show Rooms
350 Broadway, N. Y.

Southern Office,
James Bldg., Chattanooga, Tenn.

Philadelphia Sales and Show Rooms
Colonial Trust Bldg., 13th and Market Sts.

fabric at each extremity of this width and placing its thread under the thread from the bobbin below, locks it in the approved manner. The width of the eyelet can be regulated and also the number of stitches made in the circle; it would seem that the threads should be placed as thickly together as possible, but there is a limit to this. If the sewing threads are too densely packed, they tend to overpower the ground fabric on which they are worked and the eyelet may lose its grip on the ground fabric and come away from it in a lump whenever strain is applied by the tapes. The machine adjuster must strike the happy medium and have the threads of the eyelet sufficiently close to present a complete unit of eyelet and avoid raggedness. On the other hand, overlapping and crowding of the sewing cottons in the eyelet must be avoided.

The making of button holes is one of the most important of the subsidiary operations of knit goods trimming and the problems are rather different to making button holes on woven cloth. In the woven texture as produced on the loom, the fabric is absolutely rigid and the button hole structure can correspond with this. In the knitted fabric to excise the split for the hole, you create a row of partially-cut loops which form a line of weakness owing to their ever-ready tendency to unravel. Again, the rigidity of the machine-made button hole does not always consort with the innate elasticity of the knitted fabric, and scant efforts have been directed towards what is termed the hand hole button hole. Why should all this striving be to obtain a button hole which shall be like the item as made by hand? The reason is that the expert maker of button holes by hand is able to humor the thread all the way through and the finished hole is yielding to the fingers when the buttons are drawn through. The button hole as made by hand is in the shape of a triangle; the upper part extends the width of the sewn part, at right angles we have the thread locked over the edge and the third side of the triangle completes the figure.

To produce a button hole by machine one may cut the fabric in two ways, (a) The fabric is cut first and immediately afterwards the sewing for the hole is added. (b) The sewing for the button hole is inserted first and when the item is complete, the knife is brought down sharply and the fabric is cut. Of these two systems, one may point out the relative advantages and disadvantages. If the fabric is cut first and sewn afterwards, the slit fabric tends to slip backwards and curl inwards; if the sewing is done first and the the incision made, you make sure of having the basic fabric flat, but there tends to appear frayed edges in the button hole. By the first method the edges are straight, but the thread used in making the hole tends to slip off the ground fabric more readily as it loses its support. On the whole it is preferable to thread the hole first and cut it afterwards. The machine makers have devoted attention to the slipping of the threaded hole when finished and a favorable method of giving more body is to lead in a much thicker grip or cord which is simply a thick round thread composed of a number of singles slightly twisted. This is inserted between the two constituent cotton threads all around the hole when it is being made and it imparts a desirable roundness to the button hole and greatly improves its appearance and general stability.

It may be stated that the foundation of the button hole is the two-thread lockstitch where one thread coming from the bobbin above is thrown round the lower or shuttle thread. There is, however, an important difference between the ordinary lockstich and this stitch as employed by the button hole and that is in the place where the locking takes effect. For ordinary lockstitch work, the aim is to have the two threads locking in the center between the two fabrics, being united so that the locking is evident neither on face nor back.

In the button hole variety the adjustment is altered so as to allow the locking to take place on the upper edge of the button hole which improves the appearance and gives greater service in wear. In button holes for knit goods designed for outer wear, the cord is often introduced above and below on face and back to give greater bulk, but very often a piece of strong woven fabric is added into the button hole to afford more satisfactory grip for the sewing cottons. The cords or gimps are of cotton, but very often the thread which appears on the upper edge is added in pure silk and in a color which matches the garment, all with the object of improving the finish of the completed articles so as to please the ultra critical and fashionable wearer. The cord is cut and fed automatically.

In the button hole, there are several dimensions which can be varied at will; for ordinary shape there is a straight cut which can be varied in length. The thread jump or width can also be varied, while the threads can be changed in their density in the hole being put so as to envelop or merely to touch. At the top of the button hole we have what is termed the bar, which consists of about six stitches which are placed side by side and the needle thread makes the barred threads crosswise on the face while the shuttle thread works the bars crosswise on the back. At the lower end of the button hole is also added what is known as the tail bar, which is similarly constructed to the upper bar. Between those two bars we have the width of stitching on the left of the opening and a similar width on the right. The needle jumps from side to side and the feed dog feeds in the fabric towards the worker for the left side of the hole, and for the right side the direction of travel of the dog is reversed.

The object of the upper and the lower bars in the unit is to strengthen the opening and prevent the ground fabric from being slit when the button hole is in use; they also serve to give a more finished appearance to the hole and to negotiate the space between the change-over from one direction of feed to the other. The pant button hole, as it is termed, is of a special shape, designed for outer knitted garments in particular and in place of a straight cut, we have this with a small elliptical piece cut out. In this style we only have the lower bar in the button hole, at the end opposite to the elliptical part. To make this hole the machine feeds the fabric towards the operator for its full length when the stitching is added around the hole and the direction reversed so that the fabric is fed away from the operator. When the sewed side is made, the hole is completed by a 6 or 8 bar similar to that described in the foregoing. The elliptically excised part gives greater space to negotiate the button and it is worked with much less strain and friction.

Among the duties of the underwear or outerwear manufacturer or his manager is the buying of adequate supplies of buttons with which to trim the garments which pass through his works from week to week. It is for many a tedious detail but it is well to set oneself to it and acquire a full knowledge of the many styles and qualities of these

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We have issued a new edition of the complete and informative book, "The Science of Knitting." Price $2.00.
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CIRCULAR RIBBER

indispensable items of garment trimming.

For certain grades of goods, one can adopt the system of purchasing sets of wooden moulds of various sizes and shapes with their corresponding metal bases and what is known as a button covering machine. The button moulds and their metal bases are then placed in the machine along with the fabric which has been selected to cover the buttons. This system is adopted in certain seasons by firms who cater for the trade in knitted outer-wear, when it is an advantage to have the button units in the same material as the fabric or in the same material and color. Other than this, there does not seem to be great intricacies in the subject. The item has to be selected suitable for the garments you have to treat and there must be a matching of the size of button with the length of button hole through which it will have to pass.

In attaching buttons we may distinguish the following steps:

(a) The inserting of the button into the receptacle; (b) The working backwards and forwards of the needle which enters the openings of the button to sew; (c) The addition of what are known as the tying stitches which secure the threads and finish off the operation. Again the system of sewing stitch used generally, that of the lockstitch with the needle thread pushed through the button by the needle to offer its thread to the finger of the revolving or oscillating shuttle below. The shuttle promptly takes the needle thread and passes it under its own shuttle thread to lock the two members after the manner already described.

There are two types of button-attaching machines; (a) Flat bed types in which the shuttle cannot be removed; a system which obviously causes much awkwardness in working; (b) Cylinder bed types where the shuttle is readily accessible. It has a bobbin case with a loose shuttle. We have also a system of attaching the buttons by means of the chain stitch, but for the knitting trade the firmer lockstitch is much more satisfactory. There are various styles of buttons in common use, the simplest being that with two holes rather long and narrow. These are easily attached by the plainest form of bar system where the lockstitch is employed. Such buttons may lack firmness when attached thus, as the item can be easily made to slide about 1/10-inch each way. The firmness of attachment depends on the number of threads used in the process and the machine can be set for a range from 14 threads or lines to 42, which includes all degrees of firmness likely to be required. A common thread counts for sewing them on is 40s cotton counts 3-ply, 13 1/3-single, but silk is often used for silken garments. The lines can be put in all parallel side by side, or they can be made to cross and recross, which gives still greater strength.

For general work in the knitting industry, the 4-hole button is mostly used, as this gives greater strength and grip on the fabric. The ordinary machine has a simple adjustment which enables a rapid change to be made from a 2-hole to 4-hole variety. The buttons are placed in a clamp which is self centering. Taking the holes as being arranged in a square with the two upper holes known as 1 and 2, and the two lower holes as 3 and 4, there are two general arrangements followed: (a) The cross stitch where the needle enters the holes in the order given; from 1 to 4, from 4 to 2, from 2 across to 3 when it is cut off and finished; (b) in this arrangement the needle penetrates 1 and 3 several times in succession and the crossing to 2 continues by a similar back and forward movement in stitching between 2 and 4. For sewing on buttons the sewing cotton should have its twist towards the direction of the right as giving better results than left-hand twist. The lockstitch style of button sewing machine is set to work about 1000 stitches per minute, while the chain stitch variety works at 1100 stitches per minute.

For the lockstitch button attaching machine, the industry deals in general with two arrangements: (a) A lighter style where the machine is set for 11 stitching stitches and three tying stitches; and (b) a heavier one which has 18 stitching stitches and three tying stitches. The tying stitches mentioned refer to the manner of finishing off the button after the ordinary lines have been inserted, the object being to secure the ordinary stitches from too easy unraveling. This has its counterpart in the method of attaching a button by hand when the sewing thread is inserted several times at the back to make the operation more secure. In the machine one thread is looped over the second thread three times to form a kind of knot on the back which holds the stitching.

From careful observation, one can say that the knitting industry in general has suffered in reputation from attaching the buttons too lightly, the common fault being to insert too few lines and have the stitch adjusted much too slack so that the button has too much play between itself and the fabric. This slackness results from faulty tension of the sewing cottons which should have greater drag applied so that a shorter length of thread is fed in. Further, in cases of doubt, the manufacturers should incline towards the heavier setting of the button which will have a more secure hold.

As regards the setting of the needle thread as compared with the shuttle thread, experiment with a number of types shows that the length of cotton taken from the shuttle is several times greater than that from the needle.

Recent improvements have been directed toward reducing the noises generally associated with button hole machines and they are now being constructed so that the noise is much reduced and is certainly less offensive to the ear and less jarring to the nerves.

The third edition of the "Directory of Branded Textile Merchandise," is just off the press. Over 27,000 trade names, brands and trademarks of textile products are listed in this edition, the names and owners of the brands being given. Also, in many cases, the method of distribution and sale are indicated.

This directory is intended primarily as a guide for buyers in the jobbing, converting, cutting-up, clothing and export trades in locating the various forms of branded textile merchandise. It is also a valuable reference for owners of textile trade-marks who seek to adopt new names without infringement.

The price of the directory is $5.00 per copy. Bragdon, Lord & Nagle Co., 334 Fourth Avenue, New York, are the publishers and copies may be secured direct or through COTTON's book department.

Let us show, not merely in great crises, but in every day affairs of life, qualities of practical intelligence, of hardihood and endurance, and above all the power of devotion to a lofty ideal.—*Theodore Roosevelt.*

TRUE RIBBED!

IN the quality of tops it produces, the Universal Hosiery Ribber has lifted hosiery standards to a new and higher level. Elasticity! Springy fit! Shape-clinging power! Uniformity and evenness of stitch! These elements are knit into the very fabric itself by the Universal. Investigate.

FIDELITY MACHINE COMPANY
3908-18 Frankford Ave., Philadelphia, Pa.

120 Broadway
NEW YORK CITY

James Building
CHATTANOOGA, TENN.

A hosiery top as knit on the Universal (after stretching)

The same top as above (note the stretch)

We invite our readers to make use of this department for the discussion of any and all problems arising in connection with the knitting mill from the office to the packing and shipping departments. Questions, answers or letters need not conform to any particular style and will be properly edited before publishing. All questions will be answered as promptly as possible. The names and addresses of the contributors must be given, but will be held in confidence and a pen name substituted when printed. All accepted contributions other than questions will be paid for after publication. The editors do not hold themselves responsible for any statements of opinion or fact which may appear in this department unless so endorsed. This department is open to all.

Preparing Underwear Cloth for Cutting.

EDITOR COTTON:

Replying to "Contributor No. 3431" in regard to calendering underwear cloth, will say that we have used calendering machines in treating some cloth, but have not used the length machine to which he refers. Under the circumstances, we can only suggest that he leave the cloth in the rolled-up state long enough for it to take its *natural* shape before folding for cutting. We further suggest that he may be using too wide a spreader on his folder.

CONTRIBUTOR No. 2111.

EDITOR COTTON:

In reference to the inquiry of "Contributor No. 3431" relative to calendering goods in connection with the Grand Rapids machine for cutting lengths. We have had no experience with the Grand Rapids length machine, but operate several calenders.

Theoretically, the attaching of a calender ahead of the cutting machine would be an ideal method for securing even widths and uniform garments, but from a practical standpoint we doubt its feasibility. It would be necessary to secure accurate timing between the two machines and this is an extremely difficult adjustment. Furthermore, it would be necessary to run large orders of the same size in order to not be constantly changing spreaders in the two machines.

We believe that greater speed and work uniform enough can be secured in operating these two machines as separate units.

CONTRIBUTOR No. 2110.

Long Loops on the Mock Seamer.

EDITOR COTTON:

I note the question of "S. T. (Ga.)" in "Knitting Kinks" with reference to long loops made on the Model K machine with mock seaming attachment because, as he says, when the seaming yarn drops into operation and the needle catches the yarn on the first round, the last end of the yarn does not slip out from under the yarn clamp, and instead of going under the dial, the yarn goes between the dial and the dial cap.

I find that the reason for the end of the fashion seam yarn not being pulled from the yarn clamp is caused primarily by the seam yarn getting under the latches of the seam needles in the course where it is first inserted. This results in its being fastened only through the sinker wales, and if the yarn clamp has too much spring tension or is not rounded slightly on the back, the seam yarn will pull from the yarn take-up through the sinker wales instead of dragging the end from the clamp.

I would suggest that "S. T." and any other one having this trouble, round slightly the back of both the flat spring and mechanical yarn clamps holding the end of the seam yarn and put a little more tension on the coil spring on the yarn take-up. If this does not completely stop the trouble he can use a long latch fashion marks needle for one of the seam needles, taking care to have this needle over a cylinder jack and to have the cut out fashion marks sinkers on each side of it. The long latch will not get over the yarn when first inserted, and consequently it will be drawn by the needle hook into both the needle and sinker wales, fastening it so that it will surely pull from the clamp. If this helps "S. T." I would be glad to hear it.

A. G .(N. Y.)

To Stop the Yarn Changer Trouble.

EDITOR COTTON:

Responding to "Contributor No. 4673" in regard to his question relative to a striped half-hose made on a Scott & Williams machine: All of the trouble of this kind that I have experienced is caused from the cams on the drum that changes the yarn. I think if this correspondent will try taking some off the cam that lets in the finger with the yarn that is to be changed, that he will eliminate a lot of this trouble. He will also find that by cranking a machine and watching it change yarn, that possibly it will look like the yarns are lapping over enough not to cause this trouble, yet when the machine is turned on power, it oftentimes has the tendency to reduce the lap and cause it to miss one needle, as it has in this sample sent me.

Another thing that will help this trouble will be to have the yarn clamp good and tight, so it holds the yarn until it has knitted in before it comes out from under the clamp.

In regard to the ends on the outside, there should be a small brush that is stationary by the running stitch cam, that brushes these ends on the inside of the cylinder. That is the way we always throw our ends on the inside both on knitting machines and ribbers.

I trust this information will prove of some aid to the inquirer. CONTRIBUTOR No. 6291.

EDITOR COTTON:

I have had some experience on one yarn raising out before the next one comes in on Scott & Williams B-5 machines equipped with the Scott & Williams striper or yarn changer on fancy half-hose. A question about this was asked in a recent issue on fancy half-hose.

With reference to this question, there is a certain timing that the drum can be gotten into that will eliminate this trouble. It must have one long pull and one short one, and on the short pull the yarn that is to go in next must sit on the very edge of the drum cam, just enough to keep it from dropping off, and then the long stroke changes the yarn all right.

Unless the cam is spaced wide enough apart to allow the yarn to drop in and have plenty of time to get down and catch in the needle before bringing the other yarn out, the yarn going out will lift up the yarn going in, causing it to miss the needle.

The eccentric that the pawl lever works on can be changed to time the drum differently, as well as the adjustment on the drum. There are three adjustments—the drum, the eccentric and the cam.

I hope this will help the man having the trouble.

R. J. (N. C.).

EDITOR COTTON:

Replying to "Contributor No. 4673," and his question on Scott & Williams B-5 machines, with striper on fancy half-hose, one way to help his trouble of having one yarn come out too long before the next goes in to change is to take a little bit off the lug on the yarn changer drum.

I have overcome this difficulty he speaks of by taking a little bit off the lug, but instead of cutting the lug straight off, I have cut it on a slant, which gives a more gradual and easier pull on the yarn, and I find that it is not so apt to overthrow.

It is of the utmost importance on this type of machine not to attempt to run it too fast, as too much speed also will cause this trouble. RYMI.

EDITOR COTTON:

I note the question of "Contributor No. 4673" with regard to one yarn coming out before the next goes in, on the Scott & Williams B-5 machine, with the striper on fancy half-hose, which you published in "Knitting Kinks" recently.

In my opinion, it is very likely that this man has the yarn fingers lifting higher than is necessary in order to lift the yarn safely from the needles. This would naturally shorten the lap, as the finger which is dropping in will have further to travel before getting to the needle, and the one lifting out will start to lift sooner.

All of the yarn changing lugs have large holes drilled in them to allow for a certain amount of adjustment, and under normal conditions this is enough to make a wide enough lap.

In some cases where two yarns are used in the same finger it is necessary to raise it higher than usual in order to bring the yarn which is in the back hole clear of the needles, which has the effect of lifting the front yarn out too soon. In this case it is necessary either to shorten the lug which lifts out the yarn or to slot it and cut away the cast-iron lug behind it so that it can be moved back about 1/16 inch.

Another method is to grind 1/16 inch from the lifting angle of the adjustable bar which bears on the striping drum lugs, which gives the same effect as shortening the lug.

The common method of adjusting a striping drum is to set it so that the levers which control the yarn fingers have about 3/32-inch hold on the back of the lugs at the end of the rack, then remove a needle in the middle of the low butts and turn the machine by hand, adjusting the eccentric which operates the racking pawl, so that the yarns drop in four or five needles ahead of the needle which is removed. If the yarn fingers are not set to lift too high the lap should extend about 1/2 inch behind the removed needle. There will be a difference in the place where some of the yarn fingers drop in and lift out, due to their position from right to left in the throat plate. For instance, changing from No. 5 to No. 2 finger will give a very long lap, and the reverse will give a short lap. There is enough adjustment in the lugs to take care of these small differences, so that all of the yarns enter and are removed in the same place, but, as I said before, in cases where two yarns are used in the same finger it may be necessary to alter either the lugs or the adjustable foot resting on them.

CONTRIBUTOR No. 4674.

Inspecting Underwear Fabric.

EDITOR COTTON:

I think you are doing a good work in accumulating a variety of opinions and practice on knitting mill operation, and I am glad to reply to the question of your correspondent with reference to examining knitted underwear cloth.

We advocate the use of the inspection rack for inspecting cloth after leaving the knitting machine. We keep a careful record of the number of holes, drop stitches, slubs and any other imperfection on each roll, and, also, at the time of getting this record if the average runs above a maximum that we have established in any line of imperfection, the foreman in charge of the knitting is called, and the operator that produces the cloth is also shown his bad work at that time, and every effort is made to eliminate imperfection by this process. We believe we are gaining a lot by this system .

Our inspectors are going through an average of thirty rolls a day each. We have considered using a power-reel for unrolling and rolling up the cloth, and inspecting the cloth while in motion, but we have not found this to be satisfactory.

On the form of ticket we use, we note the number of holes, drop stitches, and any other imperfection, and if the number is out of the ordinary, the foreman puts his okeh on the back of the ticket after being shown the bad work. We use a simple stand for holding the cloth by running a rod through the center, and then spread the cloth up over

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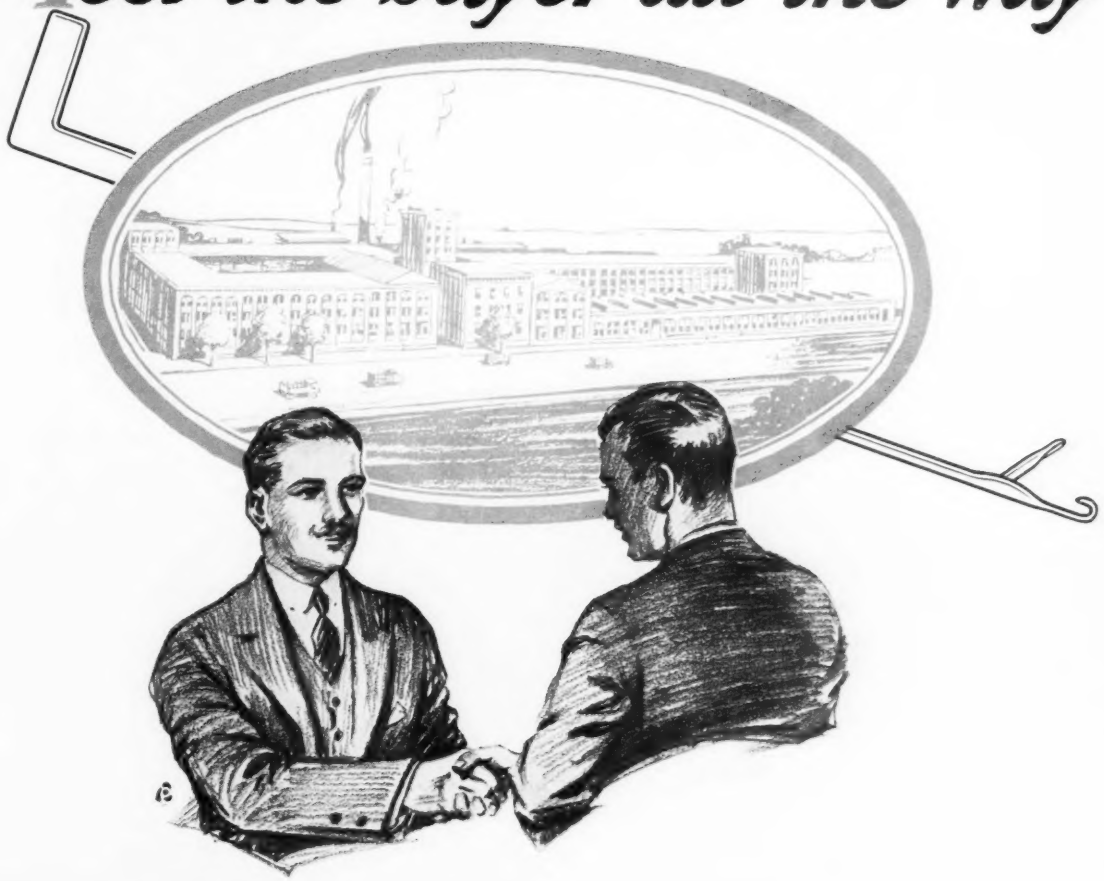

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ROLL NO.	STYLE	MACHINE NO.	KNITTER	POUNDS	DROPS	ENDS OUT	QUARTERS	NEEDLES	HOLES

a reel at the top of the frame, and the operator pulls the cloth off carefully.

As to your correspondent's specific inquiry as how many operators should inspect three hundred 65-pound rolls a day, I should say he ought to have ten inspectors for this amount of work.

CONTRIBUTOR No. 68.

The question of "Contributor No. 3428" on the subject of underwear fabric inspection at the mill, is interesting. We do this, and I give below our method.

We invariably inspect all cloth shortly after the rolls are cut from the knitting machines. A double perch is arranged in front of a south window—consisting of two lattice rollers three feet long arranged opposite to each other and parallel to the wall, mounted about seven feet above the floor and five feet apart.

The inspector, of course, works facing the window. The cloth is in a box behind him; the end is thrown over the first roller, passes over his head and over the front roller and down before the window into a box at his feet. He pulls down the cloth by hand, somewhat slowly—counting holes, drops, oil streaks, needle lines, etc. The number of defects is written in pencil on the back of the roll ticket, and if above the predetermined average ,or allowance, the roll is brought to the attention of the boss knitter. A sketch of a roll ticket that makes a satisfactory form is shown herewith. The back is left plain for the inspector's notations.

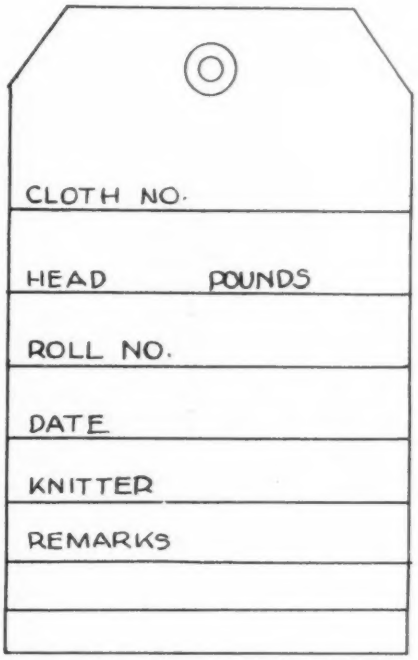
A fair allowance is eight defects in a roll of 15s/1 carded, and twenty in a roll knit from 30s/1 carded. Holes caused by yarn defects should not count against this average. One man should inspect, weigh, fold, and enter on reports about sixty rolls of average cloth daily, more than the output of the average mill.

CONTRIBUTOR No. 1323.

EDITOR COTTON:

I think you will find that underwear knitting mills generally are adopting the system of examining the fabric immediately after it has left the knitting machine, on which one of your readers recently asked a question in "Knitting Kinks."

While it is not practical in a short letter to give you full information as to how this examination is handled in our



own various mills, I might say that our examination takes place immediately after the knitting of the goods and the cloth is run over rollers which slip somewhat, so that the examiner may hold the cloth back when he is examining some imperfection ,and at the same time, it is not necessary for him to stop the machine.

Our knitting tickets are prepared in such a way that notations of the various imperfections can be marked on them and these tickets stay with the roll of cloth until it reaches the cutter and are then turned in to the office.

It is our experience that an examiner can take care of approximately 3,000 pounds per day.

CONTRIBUTOR No. 1324.

EDITOR COTTON:

In regard to inquiry and comment on fabric inspection in the underwear mill as submitted by "Contributor No. 3428" we are pleased to give you our experience on this subject as follows:

We do not have a regular cloth inspection after the cloth is knit, but we carry on a perpetual inspection in our knitting department where we operate 100 machines, by having a man circulate among these machines constantly and inspect the cloth in the process of knitting.

It is the business of this inspector to shut down machines when imperfect work is being made and to call attention of the regular knitter to bad work and have the cause therefor immediately corrected.

We have found from experience, that inspection of cloth in this manner is much more desirable than after knitting, and it will be readily appreciated that the complete re-inspection of all cloth produced, would involve an enormous expense and considerably delay production between knitting and bleaching and scouring, etc.

Under the system which we use here, the ends of all knitted rolls are indeliby stamped with the style number of the cloth, the order number, the machine diameter, the knitter's number and the weight, and when cloth is being cut in our cutting department ,we have at all times an opportunity to fix responsibility for any bad work which may not previously have been discovered by the inspector in the knitting department. We merely refer to the knitter's number on the end of the roll and his attention is directed to bad work done by him.

We are convinced that operating as we do, we get satisfactory results at a considerable saving of overhead expense, as compared with a straight inspection operation which in our business, would require no less than five men if each and every roll were inspected.

If your contributor is interested in carrying out his idea, which certainly would give him very close inspection of all knitted cloth, we are pleased to refer him to the Grand Rapids Textile Machinery Company of Grand Rapids, Michigan, who manufacture a cloth inspecting machine, but it is likely that in his own mill he can make one that will answer his requirements. He has merely to provide a take-up device which can be speeded to carry the cloth through a frame for inspection purposes.

In our acquaintance with many underwear manufacturers, we do not think that cloth inspection after knitting is a regular procedure in many mills.

If we can give you further information on the subject, please let us know.

CONTRIBUTOR NO. 1325.

EDITOR COTTON:

In your "Knitting Kinks" department a month or so ago, one of your readers asked for the experience and practice of knitted fabric manufacturers with reference to the method of inspecting the tubing, mentioning specifically the "perch" method of after-inspection.

Our product varies from swimming suits to jerseys, including sweater coats and underwear, etc., and while perhaps our method might not be of general application, I will give it to you for what it is worth since it is different from the one which your reader mentioned.

In our knitting department, the knitters have definite instructions to blue pencil every defect that they see on the web as it comes down on the machine. This, therefore, makes it very easy for the handlers of the cloth afterwards to find the defects and either mend or cut them out.

I think you are performing a distinct service to the knitting trade in providing a medium through which the mills can discuss their problems and methods.

CONTRIBUTOR NO. 1326.

Dyeing Hosiery.

EDITOR COTTON:

To the recent inquiry on the subject of the paddle or rotary type of hosiery dyeing machine on page 733, May issue, in your "Knitting Kinks," I would like to advance the following thoughts which are based solely on practical experience with the two types of machines.

(a) Every operation in connection with hosiery manufacturing must be so performed as to make the ultimate product attractive, as nearly perfect as possible and free from defects of any kind.

The great care used in the knitting department, the attention given to the goods in the boarding room, pairing and boxing departments will not make a poorly dyed or "fuzzed" stocking salable.

If these thoughts are correct, and every dyer will agree with me that they are, then it is plain to be seen that the dyer's job is not only to produce all goods uniformly dyed but it also comes under the dyer's responsibility to turn over to the boarding department smooth, clear and perfect goods without marks on the fabric caused by machinery or improper handling in the dyeing or bleaching departments.

(b) The next step to be considered, and which is directly related also to the question of the most suitable machine, is the item of complete coloring or penetrating. This feature is of special importance today where such a large part of each day's production runs in the light colors requiring but a minimum quantity of dyestuffs. Often we have been told of complaints that hosiery after only one washing process by the consumer changed the shade completely and the more frequent complaint is that the seams (either full fashion or mock seams) turn white or are of a pronounced different shade. This I feel reflects on the mill making such goods and in time (particularly if the hosiery is trade-marked) may reduce their sales.

(c) While it is not directly the dyer's responsibility in most mills nevertheless the new school dyer makes it a part of his business to analyze machinery also from a point of steam, water, soap, oil and dyestuff consumption. In addition he gives thought to the general construction to see if the yearly depreciation runs ahead or behind the actual standing-up qualities of the equipment.

(d) The ease of operating a machine, the making of additions, labor required for loading and unloading are other points which I feel to be of a great deal of importance.

In making a comparison between machinery of different types it is self evident that the best types in each group are to be considered only. A comparison between a 10 year old wooden paddle machine and the most modern present day Monel metal rotary dyeing machine would not be fair. The comparison made, which I base on practical operation of the last type of paddle machine and the modern rotary machine prompts the following opinion which is advanced for the benefit of "H. H. S." and others who are interested in the subject.

The rotary machine gives me a better chance to turn out a smooth and attractive batch because, if I have trouble matching the shade and run my load longer than the

average, no "fuzzing" or "nap" shows up on the silk or rayon.

I have found it unnecessary to remove batches from the machine, "whizz" them and then shake out the lot in order to get my shade level. I know that this I would have had to do had the same lot been placed in the paddle machine otherwise the redyes would have been very high on both machines. For this reason the paddle machine in my opinion is not equal to the rotary in producing smooth and clear work.

Penetration, as every hosiery dyer knows, is not nearly as much an item controlled by the dyeing machine as one controlled by the selection of the dyestuffs. Yet by dyeing the same goods with the same formulae one batch in the paddle the other in the rotary a fair comparison can be made as to how much more thorough one places the color into the fiber as compared with the other. There is no way that I know of to analyze the greater penetration that I have always been able to get when dyeing in the rotary machine but my ideas, which are supported by actual results, are as follows: In the paddle machine the goods float through the dye liquor and the paddle simply keeps the bags or the loose goods in motion. In the rotary machine the goods are actually carried through the dye liquor and in addition there is a certain amount of pounding going on in the pockets of the machine(much the same as in the old Tom Toms used for aniline black) and this, I believe, explains the better penetration in the rotary. It is wrong to think, as some mill owners do, that color fastness has any connection with penetration for the reason that the colors used must have been properly selected with regards to their washing and light fastness.

The paddle machine if made of Monel metal will give just as much service as the rotary machine and I feel that since there are fewer parts on the paddle machine and in view of its lower original cost that from a standpoint of maintenance costs and depreciation the paddle machine will have the edge on the rotary.

The steam consumption in the paddle machine is greater than in the rotary because in the latter the liquor is practically fully enclosed and not subject to the cooling off effects from room temperature. In the paddle a great part of the liquid is exposed and we have to keep the steam valve cracked at all times even after the bath reaches the boil. Just how much of an item steam consumption represents seems hard to figure out but in this respect the rotary in my opinion has the advantage.

Some rotary machines have a very short bath and in that case some savings can be effected in dyestuffs, oils and water. In the paddle the volume of water must be larger to allow floating or at least free circulation of the bags or loose goods.

The rotary machine is easier to operate than a paddle machine because of the pockets which hold each size. It is not necessary to pull the finished goods out of the bath and then drain the machine as in case of the paddle. I always run off the rinse bath in the rotary then open the door and do our unloading. The dye hands do not have to watch the rotary machine to see if a bag has wedged between the paddle plates and the tub, in fact it is impossible to get into trouble along that line on the rotary machine while often a bag either remains too long on the bottom in the paddle machine or hooks and this always means that we depend on the operator to keep his eyes on the paddle while the rotary needs no attention. A machine which is easy to load and unload also helps the dyer to keep down the number of dye house seconds due to rough handling by the dye house help.

In conclusion I might sum up in saying that the paddle machine has its advantages from a standpoint of cost, simplicity of construction and possibly lower maintenance. but the rotary machine will turn out quality work with less labor and with savings in steam, water, dyestuffs, etc. Since quality is the sole factor in increasing our production and the demand for our goods and since my experience is that I can get better quality from the rotary machine, my preference is decidedly for it.

CONTRIBUTOR NO. 1820.

Drop Stitches in the Gore on Standard F.

EDITOR COTTON:

I notice in "Knitting Kinks" in the April issue that "T. H. R. (Tenn.)" is having trouble with Standard F machines leaving two or three drop stiches in the gore, first one side and the the other. He says that the take-up and spring and yarn carrier have all been adjusted, and still he has this trouble.

If all of those points are in order, then about the only thing I know of that could be causing this trouble is that the switch cam is worn until it pushes the needle out and causes the hook to miss the yarn. This switch cam works under a spring and is kept tight, and if a notch wears in it, it will throw the hook away from the yarn carrier.

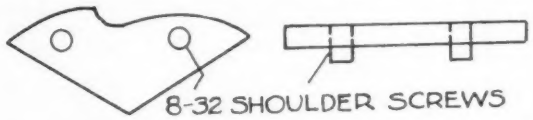
Also it is possible that the stitch cam could be worn until it does not work properly, throwing the needle away from the yarn carrier, but I think he is more likely to find his trouble in the switch cam. H. M. (GA.)

A Gauge for Stitch Cams.

EDITOR COTTON:

In the accompanying illustration I am showing a gauge which I have found very suitable for gauging stitch cams on Scott & Williams machines.

Often when changing cams, one may want to make the new cam the same as the old one in certain respects, but



by merely looking at the cam it is sometimes difficult to tell unless a gauge of some kind is fitted over the new cam to see in what way it varies from the old one.

Following is the way to make this gauge: Take a piece of flat iron a little longer and wider than the cam. Use a standard cam for a sample. Put the curve in the plate the same as the cam. Lay the cam on the plate, mark and drill holes for a 8-32 screw in the same place they are in the stitch cam. Screw the plate to the stitch cam, and cut the plate out the same shape as the cam. Take the plate off the stitch cam and put two 8-32 headless shoulder screws in the plate. Cut down the shoulders of the screws so that when the plate is laid on the stitch cam, they will fit into the holes in the cam.

These gauges can be made for left and right stitch cams, and the upper center cam. CONTRIBUTOR NO. 4340.

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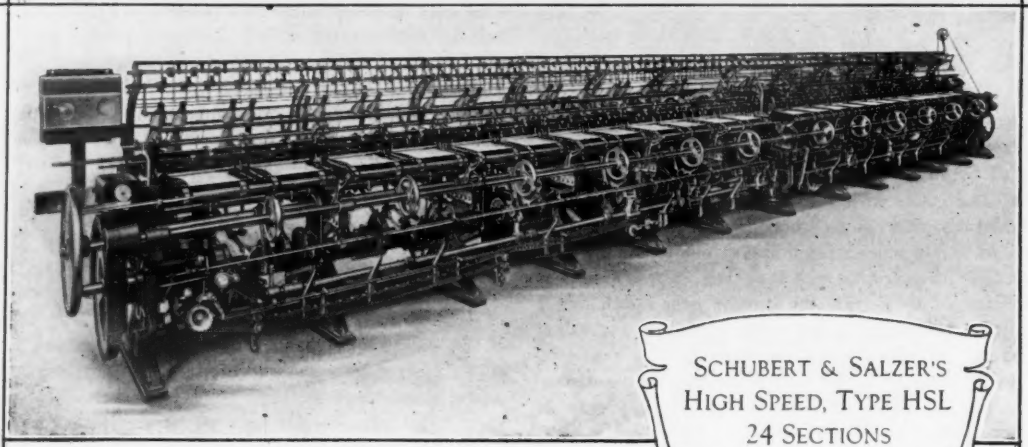

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Among the Knitting Mills.

L. C. Christman, C. J. Boland, R. A. Coble, and Arthur Thompson, of Burlington, N. C., are the organizers of a new knitting mill which will be operated in that place. Novelty half-hose will be manufactured. Two floors in the Sellars Building have been leased, and it is understood that 100 machines will ultimately be installed.

The underwear plant of the Bassett Knitting Mill, Inc., Bassett, Va., is nearing completion. The building is two stories in height, 80 x 160 feet.

Equipment has been installed in the new full-fashioned hosiery mill of the Davenport Hosiery Mills, Chattanooga, Tenn., consisting of 28 Ludwick type, 42-gauge machines. It is planned eventually to have an equipment of 100 machines. All facilities for the comfort of the employees have been installed in the building. Lockwood, Greene & Company were the engineers.

An extension to provide for additional equipment is being built by the Villa Rica Mills, Inc., Villa Rica, Ga.

A large addition is being made to the Nick-a-Jack Hosiery Mills, Chattanooga, Tenn., to provide for additional looping and finishing equipment, it is announced.

Newport Hosiery Mills, Newport, Tenn., have been leased by J. W. Kyker, to Fred Ingram and H. A. Lamon, of Greenville, Tenn. The capacity will be increased under the new management.

W. E. Lindsay, John Banner, J. W. Lovell, A. C. Webb and Lee Hatcher are interested in a new knitting mill at Mount Airy, N. C., which will manufacture boys' underwear.

Flint Hosiery Co., Burlington, N. C., has been incorporated for $50,000 by D. B. May, R. A. Coble and others.

Full operations have begun on 12 machines in the full-fashioned hosiery department of the Gordon Belt Manufacturing Co., Durham, N. C.

Magnet Knitting Mills, Clinton, Tenn., are installing full-fashioned equipment in the new unit built for that purpose.

Holland Hosiery Co., Lexington, N. C., has been incorporated by W. J. Vestal, Sr., and W. J. Vestal, Jr. The capital is $50,000.

C. E. Fogleman, John Shoffner, J. T. Black, John Moser, and others are interested in a new hosiery mill for making half-hose at Burlington, N. C.

Inspiration Hosiery Mills, Wytheville, Va., will, it is understood, erect a knitting plant.

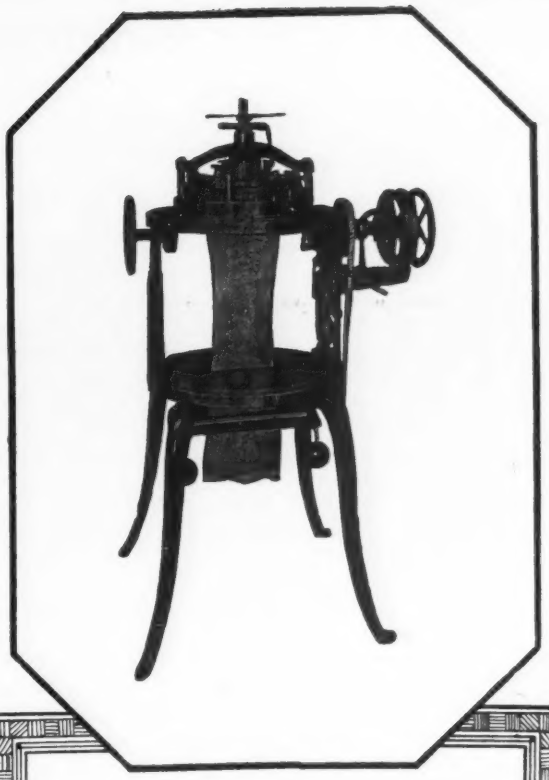
McAllester Hosiery Mills, Chattanooga, Tenn., have purchased the plant of the Tennessee Textile Mills in Alton Park, and will remove the equipment now on Williams Street to the newly acquired building.

Carroll Mills, Carrollton, Ga., are removing into a new three-story building recently purchased, and additional equipment will be installed.

O. B. McBroom, Roxboro, N. C., is starting a small hosiery mill.

Detailed plans for the construction of a knitting plant at Florence, Ala., have been made by Gardiner & Waring Company, Amsterdam, N. Y. A site has been secured, and a main building, 250x60 feet, three stories, is to be erected. Another building, 100x36 feet, two stories, will contain the dyeing and bleaching equipment. Light weight underwear will be manufactured.

An addition, to be 220x65 feet, one story, is to be erected by the Rollins Hosiery Mills, Des Moines, Iowa.



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BY W. E. BOSWELL.

Working Artificial Silk.

The reduction of the number of "seconds" and the amount of waste made in the manufacture of garments is a problem that has to be grappled with in most knitting factories.

Artificial silk is being knitted up into fabric at an increasing rate, and many difficulties have been experienced in controlling this "lively" type of yarn during the actual knitting process. Machines that have been running on cotton or wool yarns are often found to give imperfect fabric when artificial silk is worked. Very often the whole of the needles and sinkers in the machine require to be changed before a perfect fabric can be obtained. The reason is that a very slight roughness on either needle or sinker will not have any effect on wool or cotton, but will make a hairy line on artificial silk fabric. The mounting of the bobbins on the bobbin stands needs attention, as when the machine is stopped the yarn between the bobbin and the first thread guide often falls below and becomes trapped under the base of the bobbin stand, causing a break when the machine is again started.

Several methods may be adopted to prevent this. Metal saucers having a wide base and a hollow in the center 1-4 inch deep in which the bobbin will exactly fit is one way of preventing this. A more rough-and-ready method

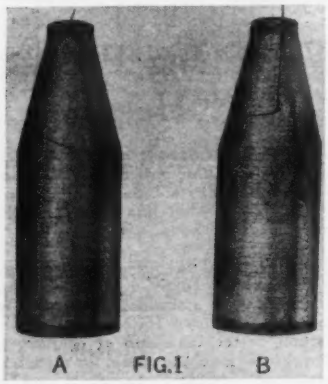


FIG. 1

is to stand the bobbin in a pad of cotton wool resting on a cardboard base. The winding of the yarn is of the utmost importance, and great attention has been given in the construction of the later types of winding machines for artificial silk to avoid any undue strain on the yarn during winding.

Lack of care in the tying of knots causes many press-offs, resulting in a large percentage of waste. Knots should be made firm and ends cut off short. Before the bobbin is restarted, the knot should be taken to the bottom of the traverse, as shown at Fig. 1 (A), and not left in the center of the traverse, as shown at B. It will be seen in the latter case that the knot causes the covering layer of yarn to drag on the knot when being worked on the machine. Porcelain or glass guides are advisable as thread guides on the knitting machine; metal guides are apt to become rough and cause a drag on the yarn.

Cotton or wool yarns do not need so much attention in preparation and will very often give a good fabric on needles that would be unsuitable for artificial silk.

Figuring the Fabric Texture.

The ideal texture of a knitted fabric can only be obtained when the right count of yarn is fed to the needles. Yarn that is too thin for the guage will give a fabric that has too many courses to the inch as the loop has to be shortened or the fabric is too flimsy and lacks body. When the yarn is too thick the loop must be lengthened or the fabric is too stiff and lacks elasticity. The number of courses to the inch in a normal fabric should be approximately one and a half times the number of needles per inch in the machine. The normal counts in worsted for various gauges are given in the following tables. Equivalent counts in other yarns would be used.

LATCH NEEDLE CIRCULAR WEB MACHINES.

10	needles per inch	2/18's to 2/22's
12	" "	2/22's to 2/26's
14	" "	2/26's to 2/30's
16	" "	2/30's to 2/36's
18	" "	2/44's to 2/52's

LATCH NEEDLE SEAMLESS HOSE MACHINES.

8	N.P.1	2/14's
10	"	2/20's
12	"	2/26's
14	"	2/36's
15	"	2/42's
16	"	2/46's
17	"	2/50's
18	"	1/28's
19	"	1/32's
20	"	1/36's

COTTON'S PATENT FRAME.

16	Gauge	2/14's to 2/16's
18	"	2/18's
20	"	2/20's
22	"	2/22's
26	"	2/26's to 2/30's
28	"	2/30's to 2/36's
30	"	2/36's to 2/42's

FLAT KNITTING MACHINE.

4	Gauge	2/12's
5	"	4/16's
7	"	3/18's
9	"	2/16's
11	"	2/20's

Seamless Hose.

Quite a number of defects in the manufacture of stockings on automatic seamless hose machines are due to the alteration in the length of loop during the making of the leg being too pronounced.

These stockings are shaped by the gradual reduction of the length of loop from the calf to the ankle. The top of the leg is made very slack for the welt and the ankle is made as stiff as possible. In an attempt to get a small ankle, the shortening of the loop in this part is often overdone and the fabric is found to contain holes due to the strain placed on the yarn during the casting of the stitch over the needle hook. The loop must be lengthened for heel and toe; in some cases this is done by the raising of the needle cylinder, and in others by the lowering of the knit-

ting cams. If the change is too pronounced, the loops on the needles underneath the stitch cams may be broken and a hole will occur.

The back of the ankle and the foot bottom are sometimes spliced, an extra thread being fed to one-half of the needles during the making of those parts. This thread is usually carried in a finger which is automatically raised and lowered as the needle cylinder rotates.

This finger should be adjusted to deliver the yarn to the first needle of the back half of the hose and be raised to clear the first needle of the front half. Seconds are often made by the splicing thread being delivered too early or too late, the spliced portion overlapping the front half of the hose at one side instead of being in line with the point of the heel and toe, as shown in Fig. 2.

The splicing is sometimes made to overlap two needles on either side of the heel. This is accomplished by the use of two medium butt needles between the long and the short

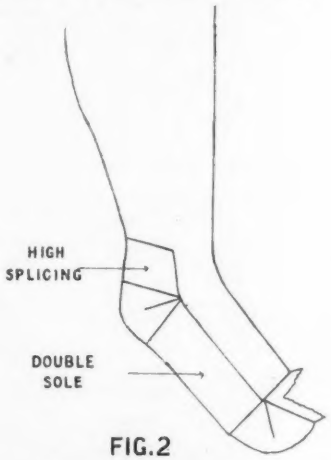


FIG.2

butts on either side. The adjustment for this is fairly easy, the lever controlling the yarn finger usually having an eccentric disk to regulate the height of the finger. Raising the finger will throw the splicing to one side, while lowering will bring the yarn in earlier and so throw the splicing to the opposite side.

The needles knitting the extra thread must be made to draw a slightly longer loop than the remainder of the needles, or the texture of one part of the fabric will be stiff and the other part slack.

The loops are drawn over the noses of the web-holding sinkers and the position of the sinkers during knitting is governed by cams in a sinker cap. The sinkers working between the needles that take the extra thread have a tapered nose, so that if these sinkers are pushed further forward than the sinkers in the other half of the cylinder, the loops will be formed over the higher part of the sinkers and a longer loop will be made to accomodate the extra yarn. On some machines this is done by arranging long butt sinkers for the spliced part and the short butt sinkers for the instep portion.

A supplemental sinker cam is brought into action to act on the long butts and thrust them forward when the splicing thread is being fed. On other machines the sinker cap is rocked from side to side during making of the ankle and foot, thus moving the cam that controls the position of the sinkers, thrusting the sinkers forward while the extra thread is being knitted. The timing of the sinker movement is very important; the sinkers must be thrust forward at the same time, as the yarn is fed to the needles and allowed to recede as the yarn is taken out. If this is not done the foot of the hose will be improperly shaped.

A defect common to all latch-needle machine fabrics is needle lines due to uneven or rough needles. Needles should be pliered where necessary after replacement of broken needles, and all needles should be level and equidistant. Sinkers are often the cause of lines which show vertically in a fabric, and all sinkers should be removed from the machine periodically and cleaned and inspected.

If the needle is faulty, the line will show along the loop; if the sinker is at fault, the line will follow the wale. "Slurgalling," or uneven length of loops showing horizontally, is usually caused by uneven setting of the stitch cams. This can be detected on multi-feed machines by marking the yarn at each feed at an equal distance from the needles. If all feeds are making an equal length of stitch, the mark on each yarn should reach the needles at the same time. Any irregularity can be at once noticed and the stitch cam raised or lowered as required to make an even fabric.—The Textile Recorder.

Apex Hosiery Company to Be Unmolested.

Philadelphia Branch No. 1, Local 706 of the American Federation of Full Fashioned Hosiery Workers, has entered into an agreement, which is a part of a court record, to discontinue molesting the Apex Hosiery Co., whose plant it was sought to unionize. The company in May procured a temporary injunction against the union. When the matter came up for final disposition in June, Michael Francis Doyle, counsel for the union, made the following statement to the court:

> On behalf of the defendants it is agreed that the defendant local and its members will not enter into the property of the plaintiff or the vicinity thereof, or molest or interfere with the plaintiff company or any of its employees, either at their place of business or at their homes.

Submisison of the agreement and its acceptance by the court averted the necessity for a court order on the injunction and, it is held, is more satisfactory to the plaintiff.

In the hosiery company's bill of complaint upon which the temporary injunction was issued the officers of the union local and 46 or other members, one of them a woman, were named. It was alleged that members of the union had on various occasions entered upon the company's property and congregated about the mill evenings for the purpose of threatening and intimidating workers, and that some gave up their employment in fear of bodily injury.

Several manufacturers in Reading and Philadelphia recently have had applications for work from numbers of full fashioned knitters who said they either had lost their jobs through unionism or gave up voluntarily under persuasion of the organization. Some of the mills are employing only non-union workers, while a few have permitted the union to organize their knitters, rather than put up a fight such as was waged by the Apex company, a strictly open shop establishment, employing 1100 persons.

The 1926 Fall Season Color Card of America has been issued by the Textile Color Card Association of the United States, Inc., 50 East 42nd St., New York City. It includes also the shoe and leather colors for the same season which is likewise issued by the color card association.

The Yarn Market

Philadelphia, Pa., June 18th, 1926.

The material improvement hopefully predicted in this report last month failed to put in any general appearance in the Philadelphia cotton yarn market during the past thirty days, leaving this resume of conditions no option in recording other than a condition similar to that which has been prevailing for some time.

Actual yarn quotations in an accepted list of rates, in fact, have shown a noticeable decrease. As illustrations, comparisons of the last appearing here last month, and that appended hereto, will reveal a general reduction throughout the pivotal numbers; for instance, 30s two-ply warps last month bore a quotation of 39½ cents, which has dropped during the month to a rate of 37 cents a pound. 60s, in two-ply combed peeler skeins and warps, lost three cents from 73 cents down to a present quotation of 70 cents asked.

These reductions in price reflect the general condition of the market here insofar as quoted prices are concerned.

Business in this market continues apathetic, according to all reports which are available. During the last month the number of orders received were in excess of those recorded for the previous period, although at the same time the aggregate business was in smaller volume, showing the trend in the manner of business. There has continued a contraction on the attitude of the consuming end to provide their requirements as they themselves secure orders.

At the same time, there seems to have developed a tendency among yarn users to take care of themselves more extensively in providing for their own complete orders instead of securing yarn in more piecemeal lots. This, however, has not had very much effect on conditions as a whole.

Regardless of the evident reductions in reported rates, the market recently has displayed a remarkable stability. With uncertainty as to the coming crop of cotton, variations have come in yarns as reflections of cotton price changes. While a general reduction during recent weeks has come about as a result, fluctuations have been absent, resulting in a more stable condition.

Fundamentally, an explanation of the continued apathy on the part of yarn buyers is in some instances attributed to a cautious attitude in their actions with reference to cotton. They want to wait until they can be certain prices are not going to experience any further drastic prunings; on the other hand, improved cotton conditions so far as price is concerned will produce the result of better inquiry for both the yarn distributor and the consumer.

An interesting sidelight on conditions is found in the fact that both mill and dealers' stocks continue small without noticeable increase.

From the spinners' attitude, reports from the yarn association with headquarters in Charlotte reflect about the same situation as has been recorded, with trading reported to continue in small lots for immediate needs, and buyers indifferent toward future commitments. During the first part of June, according to these reports, spinners had already instituted considerable curtailment. Spinners' prices "are at an advance over reported quotations," and "reported quotations based on current cotton prices are materially below replacement values." On June 9th, it was reported that partial replies to a questionnaire concerning curtailment among the spinners showed that of 750,000 spindles reporting, curtailment ranged from 17½ per cent of normal day-time run to 75 per cent, an average of between 40 and 50 per cent curtailment of day operations, indicating "that spinners are operating solely on orders, and in the absence of orders are instituting immediate and effective curtailment." Some spinners were reported taking orders nearer consumers' prices than their own in order to continue operations until the more general plan of curtailment became effective.

With June a normally dull month in textiles generally, and some possibilities of a shorter crop than has been anticipated, and with inventory period coming along, prospects seem to some factors to be more cheerful generally.

Prices on the Philadelphia market on June 18th follow:

Single Skeins.

4 to 8s	27	10s	28
12s	28½	14s	29
16s	29½	20s	31
24s	33½	26s	34½
30s	36½		

Single Warps.

8s	28½	10s	29
12s	29½	14s	30
16s	30½	20s	31½
26s	35½	30s	37½
40s	48½		

Carpet and Upholstery Yarn in Skeins.

8s 3-4 hard white warp twist	26½
8s and 9s 3-4 tinged tube	23@23½
8s ¾ hard twist waste	22@22½

Two-Ply Skeins.

8s	28	10s	28½
12s	29	14s	29½
16s	30½	20s	31½
24s	34	26s	35
30s	37	40s	46½

Two-Ply Warps.

8s	29	10s	29½
12s	30	14s	30½
16s	31	20s	32
24s	34	26s	35½
30s	37	40s	56

Frame Spun Carded Yarn on Cones.

8s	28	10s	28
12s	28½	14s	29
20s	31	22s	31½
16s	29½	18s	30½
24s	32½	26s	33½
30s	36	40s	47
30s double carded	37½	30s tying in	34½

Two-Ply Combed Peeler Skeins and Warps.

8s to 16s	42-43	20s	45-46
24s	47-48	30s	48-50
40s	56-57	50s	61-62
60s	68-70	70s	85
80s	1.00		

Single Combed Peeler Yarn on Cones.

18s	48	36s	65
24s	53	38s	66
30s	61	40s	68

Mule Spun Carded Yarn on Cones.

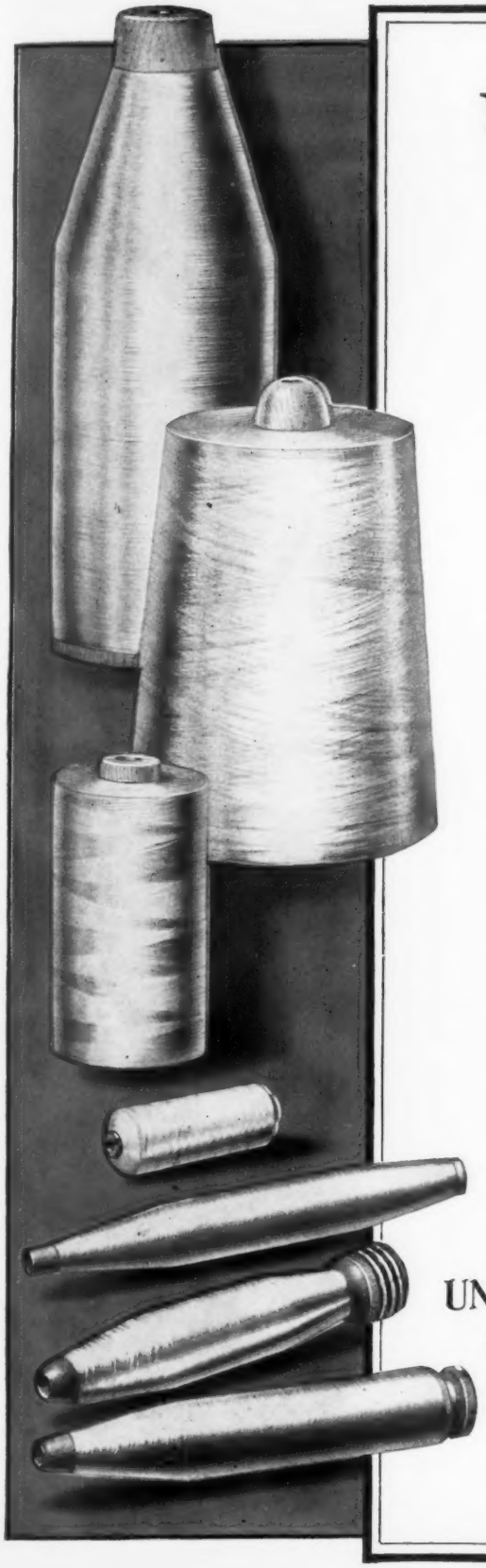
10s	34	12s	34½
14s	35	16s	35½
18s	36	20s	36½
24s	38	26s	39
30s	40	40s	50

Mule Spun Combed Peeler Yarn on Cones.

10s	42	12s	43
14s	44	16s	45
18s	46	20s	47
22s	48	26s	50
28s	51	30s	52
36s	55	38s	56
40s	61		

"Marketing of Farm Products," by Alva H. Benton, Ph.D. 427 pages. A. W. Shaw Co., Chicago, publishers. Price, $5.00 per copy.

This is an interesting book on the agricultural situation. It traces the origin and development of marketing systems and explains the marketing services, assembling, grading and standardizing, etc., and also describes the latest plans of marketing wheat and other grains and tells how the local elevators, grading standards, grain exchanges, and crop-financing methods fit into the scheme of price variation. Farmers associations, etc., are discussed, and their outstanding features analyzed.



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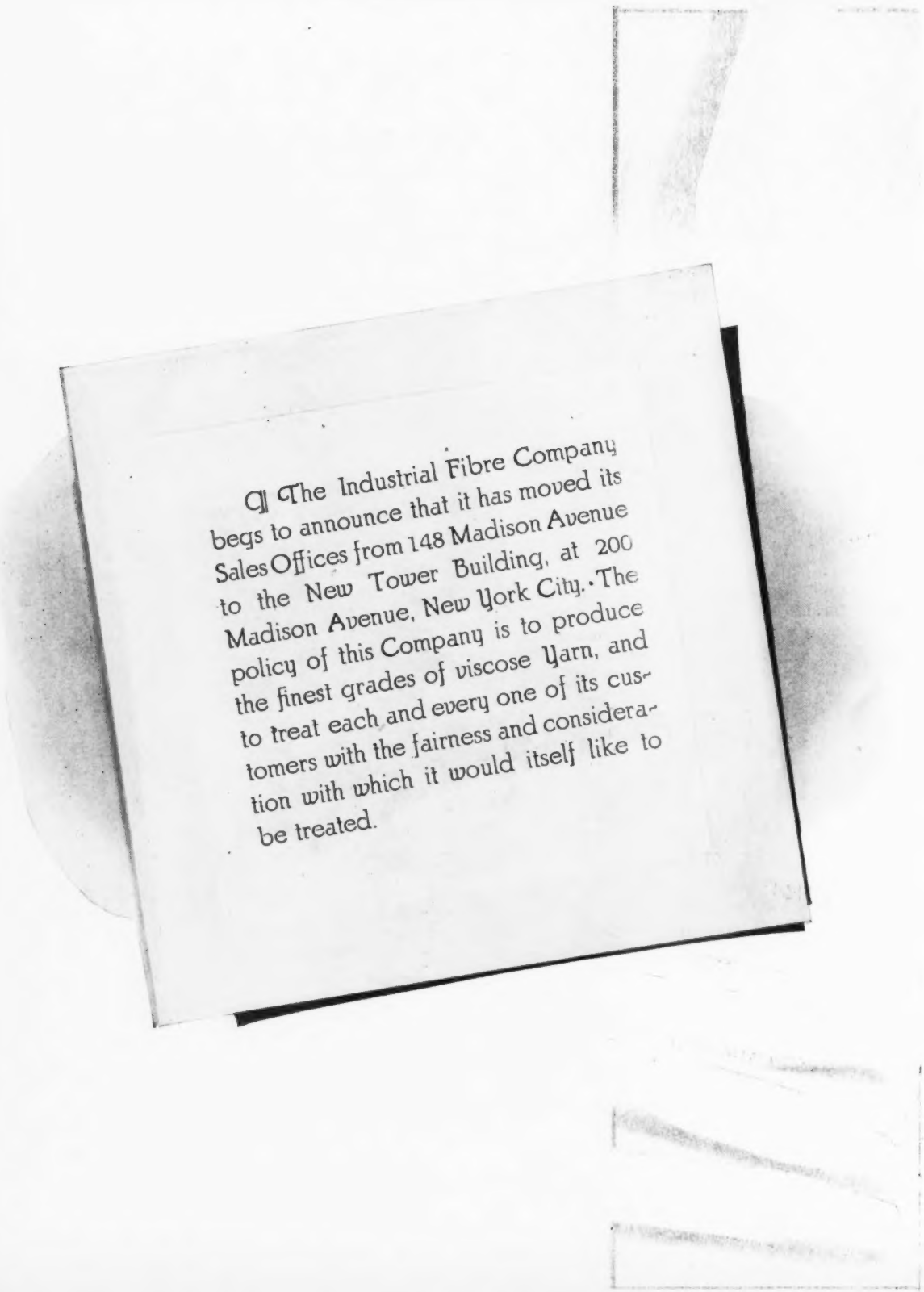

¶ The Industrial Fibre Company begs to announce that it has moved its Sales Offices from 148 Madison Avenue to the New Tower Building, at 200 Madison Avenue, New York City. The policy of this Company is to produce the finest grades of viscose Yarn, and to treat each and every one of its customers with the fairness and consideration with which it would itself like to be treated.

The Knit Goods Market

Activity in several divisions of the knit goods industries and in the primary markets is so pronounced that in the others conditions appear worse by contrast than they really are. Hosiery continues to predominate in the total volume of the knit goods business that is passing, and women's full fashioned silk is the one outstanding item in this division. Underwear has had a comparatively quiet half year, so far as relates to men's cotton garments, and, due to spring having slipped a cog in the cycle of seasons, is not promising of any very great activity at the beginning of the second six months. What was said of sweaters several months ago might be repeated in a survey of the situation. It is no better and no worse than it was, but disappointment over failure of sweaters to make the usual appeal has been salved over for the knitted outerwear industry by a right good advance business in bathing suits.

There is developing much interest in what will be the immediate outcome of the formal appearance this month of new price lists on cotton underwear and juvenile hosiery. It became apparent early in June that these lines would be opened by manufacturers in July. Jobbers were as eager to see samples and get an intimation of the price changes as were manufacturers to sound sentiment among buyers. At the time neither side was hopeful of any great volume of business being placed during the opening month, except in the event cotton gives a better showing of steadiness and the question whether producers of rayon fiber would revise prices and if so, when, cotton and rayon being the important fibers in the construction of infants' socks and the former the basis of most of the underwear. Declines in silk had left an impress that carried a psychological influence on cotton and rayon, and wool, about which there is some concern for hosiery, underwear and sweater purposes, and it is a subject of much speculation so far as relates to near-future values.

Infants' socks were opened unnecessarily early, in the circumstance, as a matter of habit. Retailer sales had been retarded by climatic conditions, and jobbers did not have anything like the usual amount of duplicate business, which obviously is true also of manufacturers. It therefore has been a question whether the sock opening might not have been deferred a month so without loss of business for manufacturer or distributor.

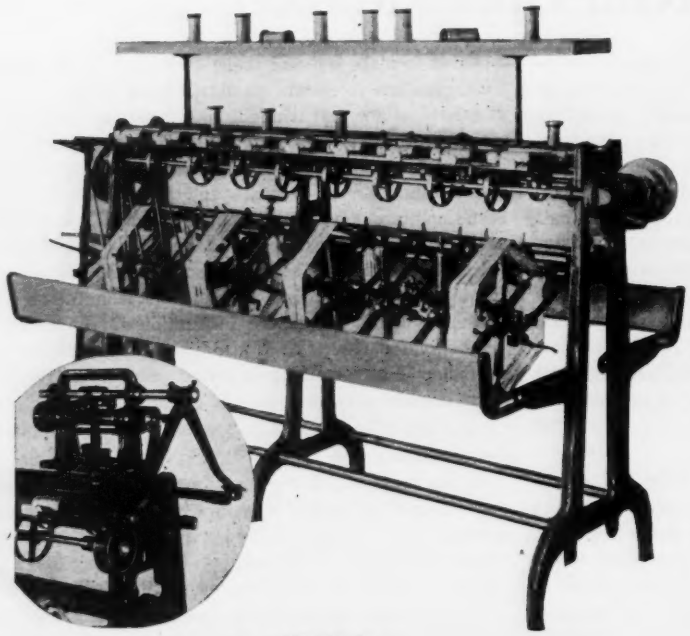
Having completed their shipments for the season earlier than ordinarily, mills in June faced a need for business, and a few were operating in a desultory way as a means for keeping working organizations approximately intact, in anticipation of a spurt in demand. But mill stocks will be light, it is stated by a half dozen of the leading manufacturers of socks, and should retailers come on the market in a body they will find jobbers pretty well cleaned up and mills in no position to relieve the tight situation which probably would be witnessed. There is the possibility of idle machinery at a time when goods will be needed.

Samples shown in a quiet way last month to a few of the leading jobbers were so closely guarded that no intimation can be given of the character of the innovations to be offered for the next season. It is understood there will be radical changes, and that these, mostly, will be in the direction of betterment, this leaving the inference it was intended to make no spectacular price reductions, it being the disposition to elevate standards rather than put prices at a level so low that it might be difficult to effect upward revisions when the raw material markets strengthen. This is the policy which was adopted by several direct-to-retailer manufacturers of women's full fashioned silk hosiery. Manufacturers have been getting less and less for their product but the consumer continues to be asked the old price, mill reductions benefiting only the distributors. The inequitableness of prices as between manufacturer and consumer doubtless was the inspiration for an appeal by retailers in Buffalo, N. Y., to the newspaper publishers of that city to refrain from giving publicity to the prices of nationally advertised brands of goods.

An about-face in misses hose is visioned by interests impressed with the favor with which full length flat hose has been received. A few manufacturers who some months ago brought out misses' stockings of tram silk, in sizes beginning with 7½ and knitted with narrowed legs, report much satisfaction with their venture, stating their sales increased even in June, when, ordinarily, the sports seven-eighth length is seen almost exclusively. An interior Pennsylvania manufacturer has three numbers each of silk, silk-and-rayon, and mercerized hose—one for misses, one for women, regular and one outsize. The retail price of the silk of either number is one dollar, and the young misses' mercerized is designed as a 35 cent seller. There is also an all-rayon boot stocking for the miss wearing size 7½, which goes over the counter at a half dollar.

To what extent the young misses' flat full length stocking may supersede the fancy top rib is a matter of conjecture. Some manufacturers of the latter say they believe ribs have seen their best days, for a time, that the drift among juvenile is to copy the attire of the seniors. There also is heard the guess that in infants socks there will be fewer of the roll top and that the plain leg will be shorter, since the pronounced hit made in the last two seasons by what is practically a legless sock and covered by patents for "kiddie kuffs." Not all of the innovations for next season will be shown generally at this month's opening, it is predicted. There are manufacturers who have profited by holding something in reserve while buyers are making their usual raid on opening prices.

Distribution of women's seamless hosiery of silk and combination yarns is maintained at a good stage, considering the intense promotion of the full fashioned. But it is noted there has been a rather sharp decline in production since early Spring, when it became apparent prices for short boot full fashioned were approaching the popular bracket for the better types of seamless. The market has been oversupplied with the 19-20 inch silk boot full fashioned since the call for all-over silk and silk to garter welt became almost universal, and the surplus has been going into a class of trade that hitherto handled the seamless almost exclusively. The result is, obviously, lessened demand for the unbranded seamless, while manufacturers selling under well established nationally advertised brands appear to be operating plants about as usual and accumulating no stock. The direct-to-retailer mills are, therefore, in a better relative position than those selling to the small-



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The Atwood is the only winder made with gear gain adjustable swifts.

The 5B Spinner

This spinner represents the highest point in silk-throwing evolution. It doubles and spins up to 14 ends of silk or Rayon, and produces perfectly wound bobbins. Improved features such as the 2 inch feed roll, spindle swing holder, and chain and sprocket drive insure uniformity of production.

Specifications and prices on request.

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ATWOOD

SILK THROWING MACHINERY

er jobbing trade, and it is observed that powerful manufacturing organizations producing both full fashioned and spring needle silk hose and distributing both under their widely known brand, see no necessity for discontinuing the seamless, although they are, in several instances, augmenting their full fashioned departments, instance the Davenport Hosiery Mills, Chattanooga, Tenn., and the Howard Hosiery Co., Philadelphia. The spring needle stocking of the Davenport is sold in leading department stores at $1.50 a pair, which is the price tag seen on some silk-to-top full fashioned, and the Howard this Spring was operating its spring needle plant to capacity on chiffon silk. This mill employs no brand, and its chiffon goes over the counter at a dollar, in chain stores, while its full fashioned silk-to-top chiffon fetches $1.95, the popular price for stockings of this description in good shops.

Notwithstanding women's circular knit silk hose is having increasingly sharper competition from the full fashioned field, it seems in no immediate danger of being crowded much further toward the tail end of the silk stocking procession. More of it was made and sold in the first four months of this year than in the corresponding period of 1925, in spite of the fact production of full fashioned had an indicated increase of nearly 40 per cent. A Philadelphia manufacturer of circular knit silk is backing his confidence in its future by installing a number of late model machines. Mills in Reading, while in the main not operating to capacity, appear to have suffered no decline in their business—that is, those distributing under established brands. This is true of those knitting both silk and silk plaited on rayon. Several are operating every available circular machine full time and accumulating no stock further than necessary for the 24-hour service required by jobbers and retailers. In Philadelphia, where a higher wage must be paid, there is more idle machinery.

A large mill whose product is a silk-and-rayon stocking with a full fashioned foot bar topped on a seamless knit leg is reported by jobbers to be seriously in arrears with deliveries. This is said to be one of the better sellers for jobbers distributing through inland retailers and the smaller metropolitan shops. Another silk-and-rayon stocking, of which however there is restricted production, that is having easy sailing is full fashioned throughout. But the business that is to be gotten with least resistance is in full fashioned silk, which may make it appear strange that a Philadelphia manufacturer selling direct to retailers is operating on a basis not better than 60 per cent of capacity and not crowded at that, while all of the larger mills selling to jobbers and most of these going to retailers direct are well supplied with orders and some of them operating overtime, notably the William Brown Co., Philadelphia, Granite brand silk in four numbers.

A manufacturer who, according to his recent declaration, is installing additional full fashioned machinery which will increase his potential production about 60 per cent, asked of another the other day whether it might not be advisable for manufacturers to take counsel among themselves for averting a surplus. "If you are afraid there is likelihood of a surplus," the other manufacturer asked, "why are you putting in more machines?" It is a common admission that at the current rate of expansion, there is every prospect of over-expansion, but it is doubted that it will be brought about this year. "There will be alternating periods of briskness and overproduction," say

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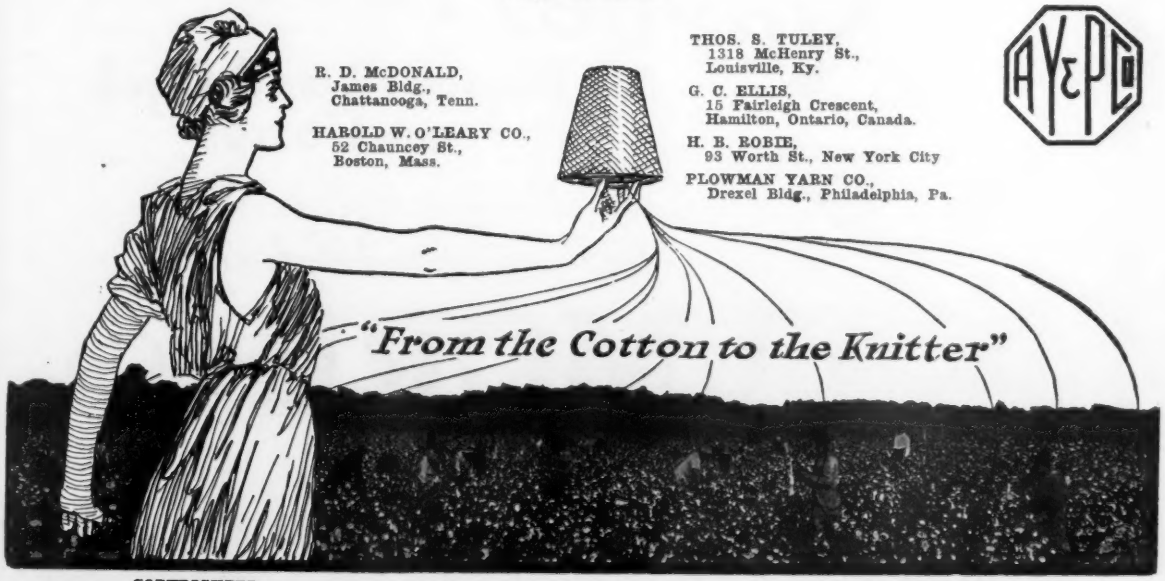

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manufacturers who are keeping close tabs on the number of new machines going into commission and the few old ones that are being scrapped, "but we experienced that when the output of silk and mercerized combined for the whole of the United States was but one tenth of what it now is."

The increase in population necessarily will absorb a large part of the added production, and full fashioned hose has been barely introduced in many sections of the country. Then, too, it is figured, its use will increase as cost of production decreases with volume output and the introduction of economies as competition becomes keener. Present demand seems to justify all of the installations of new machinery in the last two years and additions which have been provided for during the present year. There would be a different story to tell if the circular machine builders were to put on the market a device for duplicating the heel of the full fashioned stocking and solve the problem of dropping needles for narrowing.

While chiffon silk hosiery seemingly has lost nothing in its grip on feminine fancy, some interests foresee a drift to a more general use of a medium weight, described as extra heavy sheer or light service weight. Some speak of a six or seven strand chiffon, to take the place of the five thread, and look for an eight thread to become very popular as a general utility stocking. It is observed in the shops that few of the younger women call for service weights, and that the eight to ten strand makes an appeal to their elders.

One factor in the probable drift to slightly stouter chiffons is the revival of interest in white silk hose, white necessarily making a better showing in the heavier weights. Retailers in May stocked heavily in anticipation of another brisk white season. It was slow in developing, yet orders continued to come in during June, and jobbers were buying so heavily of white that it was evident increasing consumer demand was sensed by retailers. But there is, apparently, no letdown in the call for around a dozen popular bright shades adapted to wear with sports shoes.

Dealers are less hesitant to supply color specifications since the danger of price cutting by manufacturers has passed, and this being the case it may be more difficult for small jobbers to locate desirable full fashioned hosiery for spot delivery. The price bugaboo was pretty well disposed of when in June the Berkshire Knitting Mills made formal announcement of its list for the current six months period. Numbers of manufacturers had made reductions from time to time, often under pressure from jobbers, but all were waiting impatiently to hear from the Berkshire, which is credited with occupying the key situation in the matter of quotations for a season, and so soon as this company was heard from it was felt prices were safely anchored for the present selling period.

An element of doubt found its way into the market for men's fancy half hose back in May, and there could be detected some little wavering in June. A few of the leading novelty sock mills were less busy than they had been, although fancies were selling no less briskly in the stores. With mills it was a matter of pattern and the duration of the novelty craze, and to complicate the situation there developed quite an interest in polka dot socks of rayon plaited on mercerized yarn, to sell at a half dollar. Also there were shown several lines of polka dot silks. It became a question of the extent to which the resurrected

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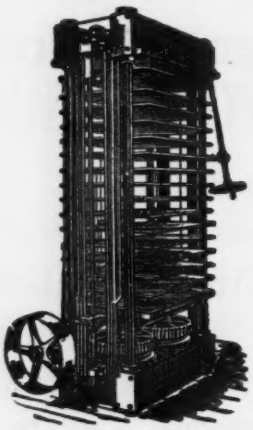

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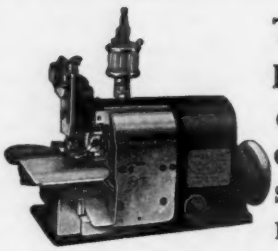

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dots might affect sales of striped half hose. Dealers themselves were uncertain and necessarily held orders down to barest needs.

A direct-to-retailer mill had orders aggregating several thousands of dozens of polka dot half hose before samples were shown. But samples hardly were necessary, as the dots were white on a variety of four backgrounds—navy, black, brown and gray. This manufacturer apparently was not certain of a long career for the dots, for he also was sampling freely of a variety of colors in vertical stripes, which, it was expected at the time, would go a long way toward supplanting the horizontal.

No little consideration is being given to reports that a few manufacturers have planned for the exploitation of plain color hose with clocks or embroidered insteps, or both. Hand embroidery was employed quite extensively about 15 years ago for high class open work socks, and seems likely to have supplied the inspiration for machine ornamentation, and clocking and striping also by the extracting process.

A line of split foot fancy half hose from a Philadelphia mill is due to appear on the market very soon. Split foot construction for moderate price tram silk socks in plain colors seems to be winning the favor of an additional number of manufacturers, who say they are looking for novelties to be very much less popular next year. This is a matter concerning which there is fully as much speculation and diversity of opinion as in any phase of construction. Most of the wool hose for Fall and Winter will be, of course, in patterns, and from what retailers say of current sales, novelties will retain their hold to the end of the present season. One of the very large direct-to-retailer mills is and for some time has been in arrears with deliveries. There is little wrong with the fancy sock market situation except a market oversupplied with patterns, of some of which there are accumulations that are being let go at distress prices, according to several manufacturers who did not hold production down to orders.

As to hosiery generally, it would appear that mill stocks are more than ample. At the end of the first four months of this year manufacturers' reports showed more finished product on hand than at the corresponding time in 1925. In April there was a material decline in shipments and orders booked from April of last year. Comparing with March last, production of all classes of hosiery in April sustained an indicated decline of around 10 per cent, one half of which was represented in the drop in cotton hosiery, including mercerized.

Underwear

Cotton underwear primary markets, inactive for some weeks, gave little indication in June of material improvement. With the season against them, according to distributors, buyers were waiting for action in cotton and the new mill prices which it had been planned to announce in July on summer weights for 1927. It had been for some weeks a foregone conclusion that the new price lists would carry downward revisions, and that so soon as these became known to retailers the latter would jockey for reductions on goods required for the present season. As, the dealers complained, cool weather had retarded their sales, they were waiting for the July price list, and were sending jobbers few repeat orders. That their stocks were

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down to the boards was indicated with each sudden rise in temperature, when quarter to half dozen orders came in floods, and then silence until another jump in the mercury. Jobbers themselves were placing probably less duplicate business than in June of any recent year. The market for light weights for the remainder of the current season therefore will depend for activity on a succession of seasonably hot days and nights, and whether any great volume of business shall be placed in July doubtless will be contingent on market happenings meanwhile,

Knitted underwear interests have been led by numbers of jobbers to feel that men's nainsook athletic suits are scoring further inroads. Nainsook manufacturers have taken full advantage of the craze for novelties, and by careful use of rayon have produced some telling effects, with the result their distribution should, logically, show a considerable gain. When this will strike hardest in the knitted is a question. Some believe men's ribs will hold their place and that low end bal briggans, as a price proposition, may not be seriously affected, if at all, while it is regarded probable that the higher price bals will have to bear the brunt of the competition with nainsooks. There are so many angles from which the underwear primary market situation may be viewed that all the more optimistic factors hope for at and immediately following the opening is the placing of sample orders and perhaps some contracting at open prices.

Predictions of jobber shyness toward summer weights receive more attention than might be the case if they were more friendly disposed toward heavy weights, of which considerable quantities remain to be contracted for. Their business in Winter lines may be measured by what has passed in Summer goods. If retailers have been as slow relatively to buy for deliveries in September as they are to take in goods for Summer, it goes without saying that jobbers have not taken much business in the former. At any rate, they are giving winter weights scant attention. And the question arises, naturally enough, will they look for reductions on what they still have to buy conforming to those which July will show in light weights? If manufacturers refrain from attempts to rush the market, it is believed their problem at the outset of one season and the middle of another will be the more easily disposed of.

Manufacturers of women's cotton underwear are experiencing a lull that a few months ago could not have been foreseen. Most of the Pennsylvania manufacturers of light weights had a fairly busy winter and early spring. But, it appears, their shipments were completed earlier than usual, and beginning about the first week in June, some were bare of orders and found it expedient to close plants or operate on reduced schedules. It is the fixed policy of the average Pennsylvania mill to put no goods of moment in stock. Desirable underwear therefore is in scant supply for spot, and where mills are operating, it is a certainty they have had repeat orders.

It is stated that manufacturers of both light and medium weight underwear for women have, in several instances, started work on the latter as orders for summer weights were completed. But fall orders are regarded more in the nature of promises, and no great volume of business seems to have been placed. Many mills therefore are in a position for taking a vacation.

Two of the better known upstate Pennsylvania manufacturers have decided upon finer gauge light weights for the next season and will give more attention to the matter of attractive finish. To some extent the scare over the prospect of rayon underwear driving cotton to the wall has abated, and the opinion is held that women's cotton underwear can be so improved in construction that, considering its elasticity and absorbent characteristics, lacking in rayon, it can be put upon almost the level of its importance of a few years ago. In its favor, it is pointed out, are durability and price. One mill is specializing in a light weight union suit containing little more fabric below the waist line than the modern bathing suit. It is appropriately given the descriptive name "Shorty." For a tryout a jobber submitted a shorty suit to his wife who, he says, "is a representative old fashioned woman." Her first comment was a look of contempt. To accommodate her husband, he says, she wore the suit. After a few days she said to him, "you might bring several more of those shorty suits home," and he did, and his verdict is that the very abbreviated union suit is destined to become as popular as what remains of woman's bathing suit.

While much has been said in praise of rayon underwear, it has yet to prove acceptable as a broad commercial proposition. It competes with glove silk only for price, and the low price rayon underthing usually does not satisfy, according to managers of underwear counters in department stores, while the really serviceable rayon, it is stated, costs woman little less than glove silk. Rayon hardly can be viewed as a competitor of silk for underwear purposes, and it is a question whether it can gather headway in the race with the more modern cotton garment.

Sweaters

Gauged by the business taken to date, it seems a question whether manufacturers of sweaters will have as much as 50 per cent of a normal volume for the year. Initial orders were not large and there have been few repeats, according to trustworthy reports from scattered representative manufacturers and New York commission houses and selling agents. Retailers' reports of light sales of women's sweaters are confirmed by the fact so few are seen in service. Something in the way of setting a style pace was expected from the southern winter resorts. This expectation was not visualized, and now there is a waiting to see what may transpire in this respect at the summer resorts in the North. If the season proves a failure for manufacturers because woman says she will not wear sweaters, it will have been proved to the satisfaction of a Philadelphia mill executive that "henceforth it will be futile to try to force on woman any style that she does not approve, no matter where it may originate or who undertakes to introduce it as the creation of some stylist, foreign or domestic."

Sweaters for women are inactive because of style changes, that's all; but why they are not so popular for men as formerly is not so easily accounted for, except on the theory that they have not been able to withstand the assault from the lumberjack. A few shakers and other staples are selling, and some little business in cricket coats is coming through, but except as to sports lines, wanted for wear afield, sweaters are not promising a movement sufficient to make them profitable to more than a comparatively few manufacturers of distinctive lines.

A. C. REVELS has resigned his position with the R. P. Yarn Company, New Haven, Conn., to accept a place with the new mill to be erected by the Unity Spinning Mills, at LaGrange, Ga.